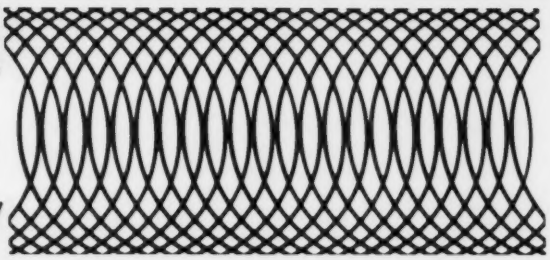
Ultrasound in medicine and biology



Author–Subject Index
Volume 16 (1990)

Compiled by

Michael Halliwell

Department of Medical Physics, Bristol General Hospital, Bristol BS1 6SY, England

PERGAMON PRESS

NEW YORK · OXFORD · FRANKFURT
SEOUL · SYDNEY · TOKYO

ULTRASOUND IN MEDICINE AND BIOLOGY

WORLD FEDERATION FOR ULTRASOUND IN MEDICINE AND BIOLOGY

President: F. WEILL, *Besançon, France*
Vice-President: P. N. T. WELLS, *Bristol, England*
Past-President: H. E. THOMPSON, *Denver, U.S.A.*
President-Elect: M. FUKUDA, *Sapporo, Japan*
Treasurer: B. GOLDBERG, *Philadelphia, U.S.A.*
Secretary: D. ROBINSON, *Chatswood, Australia*
Editor of the Journal: D. N. WHITE, *Kingston, Canada*
Councillors: R. C. OTTO, *Zurich, Switzerland*
H. TAKEUCHI, *Tokyo, Japan*
H. WATANABE, *Kyoto, Japan*

AFFILIATED SOCIETIES

American Institute of Ultrasound in Medicine (AIUM), F. Kremkau, Secretary, 4405 East-West Highway, Suite 504, Bethesda, MD 20814, U.S.A.

Australasian Society for Ultrasound in Medicine (ASUM), L. de Crespigny, Secretary, 2/181 High Street, Willoughby, NSW 2068, Australia

Egyptian Society for Ultrasonics (ESU), Dr. Y. Mohran, Secretary, 376 Pyramids Road, Giza, Cairo, Egypt

European Federation of Societies for Ultrasound in Medicine and Biology (EFSUMB), Dr. W. N. McDicken, Dept. of Medical Physics, The Royal Infirmary, Edinburgh EH4 2XU, Scotland

Indian Society of Medical Ultrasound, Dr. C. V. Vanjani, President, 133A-18 Ram-Kutir, L.J. Road, Mahim, Bombay 400 016, India

Indonesian Society of Medical Ultrasonography (PUSKI), Dr. D. Makes, Dept. of Radiology, Medical Faculty, University of Indonesia, J1, Salemba No. 6, Jakarta 10430, Indonesia

Japan Society of Ultrasound in Medicine (JSUM), Dr. K. Ito, Secretary, Suzuki Building, 4F, 2-26-9, Hongo, Bunkyo-ku, Tokyo 113, Japan

Latin-American Federation of Societies of Ultrasound in Medicine and Biology (LAFSUMB), Dr. Giovanni Guido Cerri, Av. Paulista, 491 13.° conj. 132, CEP 01311, São Paulo, Brasil

Malaysian Society of Ultrasound in Medicine (MSUM), Dr. S. K. Ong, Secretary, N.S. Chinese Maternity Hospital and Medical Center, Jalan Templer, Seremban, Negri Sembilan, Malaysia

Societas Internationalis pro Diagnostica Ultrasonica in Ophthalmologia (SIDUO), Dr. Gerhard Hasenfratz, Augenklinik der Universitat Munchen, Mathildenstr. 8, D-8000 Munchen 2, Germany

South African Medical Ultrasound Society (SAMUS), Dr. M. Jacobson, Secretary SAMUS, Box 93499, Yeoville 2143, Republic of South Africa

Publishing, Advertising, and Subscription Offices: Pergamon Press, Inc., Fairview Park, Elmsford, NY 10523, U.S.A.; or Pergamon Press plc, Headington Hill Hall, Oxford OX3 0BW, England.

Published 9 per annum. Annual institutional subscription rate (1991): US $350.00; *Two-year institutional subscription rate* (1991/92): US $665.00. *Personal subscription rate* for those whose library subscribes at the regular rate (1991): US $99.00. Members of the World Federation for Ultrasound in Medicine and Biology may order personal subscriptions at a concessional rate; details of these rates are available upon request. Prices are subject to change without notice. Notify 8 weeks in advance of address change with a copy of the subscription mailing label. *Back Issues:* Back issues of all previously published volumes, in both hard copy and on microform, are available direct from Pergamon Press offices. Subscription rates for Japan include despatch by air and prices are available on application.

Copyright © 1991 Pergamon Press plc

The Item-Fee Code for this publication is: 0301-5629/91 $3.00 + .00

It is a condition of publication that manuscripts submitted to this journal have not been published and will not be simultaneously submitted or published elsewhere. By submitting a manuscript, the authors agree that the copyright for their article is transferred to the publisher if and when the article is accepted for publication. The copyright covers the exclusive rights to reproduce and distribute the article, including reprints, photographic reproductions, microform or any other reproductions of similar nature and translations. No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, electrostatic, magnetic tape, mechanical, photocopying, recording or otherwise, without permission in writing from the copyright holder.

Photocopying information for users in the U.S.A. The Item-Fee Code for this publication indicates that authorization to photocopy items for internal or personal use is granted by the copyright holder for libraries and other users registered with the Copyright Clearance Center (CCC) Transactional Reporting Service provided the stated fee for copying, beyond that permitted by Section 107 or 108 of the Unites States Copyright Law, is paid. The appropriate remittance of $3.00 per copy per article is paid directly to the Copyright Clearance Center Inc., 27 Congress Street, Salem, MA 01970.

Permission for other use. The copyright owner's consent does not extend to copying for general distribution, for promotion, for creating new works, or for resale. Specific written permission must be obtained from the publisher for copying. Please contact the Subsidiary Rights Manager, Publishing Services Dept. at either Pergamon Press plc or Pergamon Press, Inc.

Ultrasound in Medicine and Biology (ISSN 0301-5629) Nine issues per annum. Second-Class postage paid at Elmsford, NY and additional mailing offices. POSTMASTER: Send address changes to: *Ultrasound in Medicine and Biology*, Pergamon Press, Inc., Fairview Park, Elmsford, NY 10523.

AUTHOR/SUBJECT INDEX

A

A-mode analysis
intraoperative venous dilation and subsequent development of deep vein thrombosis in patients undergoing total hip or knee replacement (Stewart), 133

Abdomen
ultrasound attenuation coefficient in the fetal liver as a function of gestational age (Carson), 399

Abraham, V., see Ziskin, M. C.

Adamson, S. L., Morrow, R. J., Langille, B. L., Bull, S B. and Ritchie, J. W. K.: site-dependent effects of increases in placental vascular resistance on the umbilical arterial velocity waveform in fetal sheep, 19

Adler, D. D., Carson, P. L., Rubin, J. M. and Quinn-Reid, D.: Doppler ultrasound color flow imaging in the study of breast cancer: preliminary findings, 553

Adler, R. S., Rubin, J. M., Bland, P. H. and Carson, P. L.: quantitative tissue motion analysis of digitized M-mode images: gestational differences of fetal lung, 561

Adolescents
transcranial pulsed Doppler measurements of blood flow velocity in the middle cerebral artery: reference values at rest and during hyperventilation in healthy children and adolescents in relation to age and sex (Brouwers), 1

Age
transcranial pulsed Doppler measurements of blood flow velocity in the middle cerebral artery: reference values at rest and during hyperventilation in healthy children and adolescents in relation to age and sex (Brouwers), 1

Alburger, P. D., see Stewart, G. J.

Alfirevic, Z., see Kurjak, A.

Aliasing
on the behaviour of instantaneous frequency estimators implemented on Doppler flow imagers (Nowicki), 511
the use of a Diasonics DRF400 duplex ultrasound scanner to measure volume flow in arterio-venous fistulae in patients undergoing haemodialysis: an analysis of measurement uncertainties (Oates), 571

Anatomy
evaluation of fetal structural heart disease using color flow mapping (Chiba), 221
transcranial Doppler sonography: anatomical landmarks and normal velocity values (Ringelstein), 745

Angelsen, B. A. J., see Linker, D. T.

Angiodynography
visualization of calf veins by color flow imaging (van Bemmelen), 15

Angiogenesis
the effect of therapeutic ultrasound on angiogenesis (Young), 261

Angiotensin II
site-dependent effects of increases in placental vascular resistance on the umbilical arterial velocity waveform in fetal sheep (Adamson), 19

Annular array
clinical performance of a cone/annular array ultrasound breast scanner (Fishell), 361

Aorta
computer evaluation of Doppler spectral envelope area in patients having a valvular aortic stenosis (Cloutier), 247
estimation of aortic and pulmonary blood flow in a paediatric population using Doppler ultrasound: an *in vitro* study (Soul), 659
fetal Doppler shift waveforms in intrauterine growth retardation: Laplace transform analysis technique (Stone), 773

Aortic diameter
computer evaluation of Doppler spectral envelope area in patients having a valvular aortic stenosis (Cloutier), 247

Aortic stenosis
computer evaluation of Doppler spectral envelope area in patients having a valvular aortic stenosis (Cloutier), 247

Aortic valve area
computer evaluation of Doppler spectral envelope area in patients having a valvular aortic stenosis (Cloutier), 247

Arterial diameter
assessment of the distensibility of superficial arteries (Hoeks), 121
computer evaluation of Doppler spectral envelope area in patients having a valvular aortic stenosis (Cloutier), 247
determination of the luminal diameter of the radial artery in man by high frequency ultrasound: a methodological study (Nielsen), 787

Arterial disease
morphological characterization of carotid artery stenoses by ultrasound duplex scanning (Widder), 349

Arterial pulsatility
site-dependent effects of increases in placental vascular resistance on the umbilical arterial velocity waveform in fetal sheep (Adamson), 19

Arterio-venous fistula
the use of a Diasonics DRF400 duplex ultrasound scanner to measure volume flow in arterio-venous fistulae in patients undergoing haemodialysis: an analysis of measurement uncertainties (Oates), 571

Artery
a triangulation method for the quantitative measurement of arterial blood velocity magnitude and direction in humans (Schrank), 499

a validation study on the reproducibility of transcranial Doppler velocimetry (Maeda), 9
assessment of the distensibility of superficial arteries (Hoeks), 121
determination of the luminal diameter of the radial artery in man by high frequency ultrasound: a methodological study (Nielsen), 787
Doppler waveform pulsatility index and resistance, pressure and flow in the umbilical placental circulation: an investigation using a mathematical model (Thompson), 449
estimation of aortic and pulmonary blood flow in a paediatric population using Doppler ultrasound: an *in vitro* study (Soul), 659
fetal Doppler shift waveforms in intrauterine growth retardation: Laplace transform analysis technique (Stone), 773
morphological characterization of carotid artery stenoses by ultrasound duplex scanning (Widder), 349
relationship between pulsatility indices of Doppler flow signals and CO_2-reactivity within the middle cerebral artery in extracranial occlusive disease (Ley-Pozo), 763
site-dependent effects of increases in placental vascular resistance on the umbilical arterial velocity waveform in fetal sheep (Adamson), 19
the assessment of abnormal pelvic blood flow by transvaginal color and pulsed Doppler (Kurjak), 437
the use of a Diasonics DRF400 duplex ultrasound scanner to measure volume flow in arterio-venous fistulae in patients undergoing haemodialysis: an analysis of measurement uncertainties (Oates), 571
transcranial Doppler sonography: anatomical landmarks and normal velocity values (Ringelstein), 745
transcranial pulsed Doppler measurements of blood flow velocity in the middle cerebral artery: reference values at rest and during hyperventilation in healthy children and adolescents in relation to age and sex (Brouwers), 1

Artifact
effect of scan format on refraction artifacts (Ziskin), 183
on the behaviour of instantaneous frequency estimators implemented on Doppler flow imagers (Nowicki), 511

Attenuation
correlation of tissue constituents with the acoustic properties of skin and wound (Olerud), 55
diffraction correction methods for pulse-echo acoustic attenuation estimation (Cespedes), 707
effects of physical parameters on high temperature ultrasound hyperthermia (Billard), 409
ultrasonic assessment of skin and surgical wounds utilizing backscatter acoustic techniques to estimate attenuation (Forster), 43
ultrasound attenuation coefficient in the fetal liver as a function of gestational age (Carson), 399

Autocorrelation
on the behaviour of instantaneous frequency estimators implemented on Doppler flow imagers (Nowicki), 511

Autoregressive model order
selection of the order of autoregressive models for spectral analysis of Doppler ultrasound signals (Schlindwein), 81

Autoregressive spectrum analysis
a simulation of transit time effects in Doppler ultrasound signals (Jones), 607
selection of the order of autoregressive models for spectral analysis of Doppler ultrasound signals (Schlindwein), 81

Autosomal recessive polycystic kidney disease
prenatal diagnosis by ultrasound in pregnancies at risk for autosomal recessive polycystic kidney disease (Reuss), 355

Axial beam translation
diffraction correction methods for pulse-echo acoustic attenuation estimation (Cespedes), 707

Ayme-Bellegarda, E. J., see Carstensen, E. L.

Axon
temporally-specific modification of myelinated axon excitability *in vitro* following a single ultrasound pulse (Mihran), 297

B

B/A imaging
ultrasonic imaging of the nonlinear parameter B/A: simulation studies to evaluate phase and frequency modulation methods (Kim), 175

Background noise level
computer evaluation of Doppler spectral envelope area in patients having a valvular aortic stenosis (Cloutier), 247

Backscatter
a comparison of the Doppler spectra from human blood and artificial blood used in a flow phantom (Hoskins), 141
autocorrelation length of normal and myopathic human myocardium measured by acoustic microscopy: implications for clinical ultrasonic tissue characterization (Linker), 793
myocardial ultrasonic backscatter for characterization of ischemia and reperfusion: relationship to wall motion (Barzilai), 391
ultrasonic assessment of skin and surgical wounds utilizing backscatter acoustic techniques to estimate attenuation (Forster), 43
ultrasonic myocardial integrated backscatter and myocardial wall thickness in animal experiments (Rijsterborgh), 29

Bacon, R. J., see Soul, F. J.
Baker, J. D., see Stone, P. R.
Barnes, F. S., see Mihran, R. T.
Barzilai, B., Vered, Z., Mohr, G. A., Wear, K. A., Courtois, M., Sobel, B. E., Miller, J. G. and Perez, J. E.: myocardial ultrasonic backscatter for characterization of ischemia and reperfusion: relationship to wall motion, 391
Bascom, P. A. J. and Cobbold, R. S. C.: effects of transducer beam geometry and flow velocity profile on the Doppler power spectrum: a theoretical study, 279

Basilar artery
a validation study on the reproducibility of transcranial Doppler velocimetry (Maeda), 9

Beam computation
effects of transducer beam geometry and flow velocity profile on the Doppler power spectrum: a theoretical study (Bascom), 279

Beam profile
effects of transducer beam geometry and flow velocity profile on the Doppler power spectrum: a theoretical study (Bascom), 279
estimation of aortic and pulmonary blood flow in a paediatric population using Doppler ultrasound: an *in vitro* study (Soul), 659

Bedford, G., see van Bemmelen, P. S.
van Bemmelen, P. S., Bedford, G. and Strandness, D. E.: visualization of calf veins by color flow imaging, 15
Berding, C., see Delius, M.

Bifurcation depth
transcranial pulsed Doppler measurements of blood flow velocity in the middle cerebral artery: reference values at rest and during hyperventilation in healthy children and adolescents in relation to age and sex (Brouwers), 1

Billard, B. E., Hynynen, K. and Roemer, R. B.: effects of physical parameters on high temperature ultrasound hyperthermia, 409

Biochemistry
correlation of tissue constituents with the acoustic properties of skin and wound (Olerud), 55

Bioeffects
biological effects of shock waves: cavitation by shock waves in piglet liver (Delius), 467
biological effects of shock waves: cell disruption, viability, and proliferation of L1210 cells exposed to shock waves *in vitro* (Gambihler), 587
biological effects of shock waves: effect of shock waves on the liver and gallbladder wall of dogs—administration rate dependence (Delius), 459
effects of lithotripter fields on development of chick embryos (Hartman), 581
influence of the shock wave application mode on the growth of A-Mel 3 and SSK2 tumours *in vivo* (Weiss), 595
killing of *Drosophila* larvae by the fields of an electrohydraulic lithotripter (Carstensen), 687
lung damage from exposure to pulsed ultrasound (Child), 817
lung damage from exposure to the fields of an electrohydraulic lithotripter (Hartman), 675
lysis of cells in *Elodea* leaves by pulsed and continuous wave ultrasound (Carstensen), 167
macrophage responsiveness to therapeutic ultrasound (Young), 809
protein synthesis stimulated in sonicated sugar beet cells and protoplasts (Joersbo), 719
test for kidney hemorrhage following exposure to intense, pulsed ultrasound (Carstensen), 681
the biochemical effects of low intensity ultrasound on healing tendons (Enwemeka), 801
the effect of therapeutic ultrasound on angiogenesis (Young), 261

Blood
a comparison of the Doppler spectra from human blood and artificial blood used in a flow phantom (Hoskins), 141

Birer, A., see Lewin, P. A.
Bland, P. H., see Adler, R. S.
Blathras, K., see Ziskin, M. C.

Blood flow
a simulation of transit time effects in Doppler ultrasound signals (Jones), 607
a triangulation method for the quantitative measurement of arterial blood velocity magnitude and direction in humans (Schrank), 499
acute effects of ultrasound on skeletal muscle oxygen tension, blood flow and capillary density (Rubin), 271
automatic vessel tracking and measurement for Doppler studies (Wilson), 645
Doppler color flow in echocardiography: analytical and *in vitro* investigations of the quantitative relationship between orifice flow and color jet dimensions (Holen), 543
estimation of aortic and pulmonary blood flow in a paediatric population using Doppler ultrasound: an *in vitro* study (Soul), 659
fetal Doppler shift waveforms in intrauterine growth retardation: Laplace transform analysis technique (Stone), 773
myocardial ultrasonic backscatter for characterization of ischemia and reperfusion: relationship to wall motion (Barzilai), 391
on the behaviour of instantaneous frequency estimators implemented on Doppler flow imagers (Nowicki), 511
site-dependent effects of increases in placental vascular resistance on the umbilical arterial velocity waveform in fetal sheep (Adamson), 19
the assessment of abnormal pelvic blood flow by transvaginal color and pulsed Doppler (Kurjak), 437
the use of a Diasonics DRF400 duplex ultrasound scanner to measure volume flow in arterio-venous fistulae in patients undergoing haemodialysis: an analysis of measurement uncertainties (Oates), 571
uterine bloodflow velocity waveforms before and after transcervical chorionic villus sampling (Cohen-Overbeek), 129
visualization of calf veins by color flow imaging (van Bemmelen), 15

Blood velocity
a triangulation method for the quantitative measurement of arterial blood velocity magnitude and direction in humans (Schrank), 499
a validation study on the reproducibility of transcranial Doppler velocimetry (Maeda), 9
automatic vessel tracking and measurement for Doppler studies (Wilson), 645
Doppler color flow in echocardiography: analytical and *in vitro* investigations of the quantitative relationship between orifice flow and color jet dimensions (Holen), 543
effects of transducer beam geometry and flow velocity profile on the Doppler power spectrum: a theoretical study (Bascom), 279
estimation of aortic and pulmonary blood flow in a paediatric population using Doppler ultrasound: an *in vitro* study (Soul), 659
evaluation of fetal structural heart disease using color flow mapping (Chiba), 221
fetal Doppler shift waveforms in intrauterine growth retardation: Laplace transform analysis technique (Stone), 773
inter- and intra-observer variability of Doppler peak velocity measurements: an *in vitro* study (Tessler), 653
on the behaviour of instantaneous frequency estimators implemented on Doppler flow imagers (Nowicki), 511

the assessment of abnormal pelvic blood flow by transvaginal color and pulsed Doppler (Kurjak), 437
transcranial Doppler sonography: anatomical landmarks and normal velocity values (Ringelstein), 745
transcranial pulsed Doppler measurements of blood flow velocity in the middle cerebral artery: reference values at rest and during hyperventilation in healthy children and adolescents in relation to age and sex (Brouwers), 1
uterine bloodflow velocity waveforms before and after transcervical chorionic villus sampling (Cohen-Overbeek), 129

Bom, N., see Rijsterborgh, H.

Brachial artery
the use of a Diasonics DRF400 duplex ultrasound scanner to measure volume flow in arterio-venous fistulae in patients undergoing haemodialysis: an analysis of measurement uncertainties (Oates), 571

Brands, P. J., see Hoeks, A. P. G.

Breast
clinical performance of a cone/annular array ultrasound breast scanner (Fishell), 361
Doppler ultrasound color flow imaging in the study of breast cancer: preliminary findings (Adler), 553

Brendel, W., see Delius, M.
Brendel, W., see Gambihler, S.
Brendel, W., see Weiss, N.
Brewer, L., see Hartman, C.
Brouwers, P. J. A. M., Vriens, E. M., Musbach, M., Wieneke, G. H. and van Huffelen, A. C.: transcranial pulsed Doppler measurements of blood flow velocity in the middle cerebral artery: reference values at rest and during hyperventilation in healthy children and adolescents in relation to age and sex, 1
Brunstedt, J., see Joersbo, M.
Bull, S. B., see Adamson, S. L.

C

Cadaver study
histological analysis of ultrasonic images of the prostate: an accurate technique (Hendrikx), 667
transcranial Doppler sonography: anatomical landmarks and normal velocity values (Ringelstein), 745

Calf vein thrombosis
visualization of calf veins by color flow imaging (van Bemmelen), 15

Campbell, D. S., see Carstensen, E. L.

Capacitance hydrophone
capacitance hydrophones for pressure determination in lithotripsy (Filipczynski), 157

Capillary density
acute effects of ultrasound on skeletal muscle oxygen tension, blood flow and capillary density (Rubin), 271

Cardiology
Doppler color flow in echocardiography: analytical and *in vitro* investigations of the quantitative relationship between orifice flow and color jet dimensions (Holen), 543
myocardial ultrasonic backscatter for characterization of ischemia and reperfusion: relationship to wall motion (Barzilai), 391

Cardiomyopathy
autocorrelation length of normal and myopathic human myocardium measured by acoustic microscopy: implications for clinical ultrasonic tissue characterization (Linker), 793

Carotid artery
a comparison of three different filters for speckle reduction of Doppler spectra (Hoskins), 375
morphological characterization of carotid artery stenoses by ultrasound duplex scanning (Widder), 349

Carson, P. L., Meyer, C. R., Chiang, E. H., Faix, R. G. and Marks, T. I.: ultrasound attenuation coefficient in the fetal liver as a function of gestational age, 399
Carson, P. L., see Adler, D. D.
Carson, P. L., see Adler, R. S.
Carstensen, E. L., Campbell, D. S., Hoffman, D., Child, S. Z. and Ayme-Bellegarda, E. J.: killing of *Drosophila* larvae by the fields of an electrohydraulic lithotripter, 687
Carstensen, E. L., Child, S. Z., Crane, C., Miller, M. W. and Parker, K. J.: lysis of cells in *Elodea* leaves by pulsed and continuous wave ultrasound, 167
Carstensen, E. L., Hartman, C., Child, S. Z., Cox, C. A., Mayer, R. and Schenk, E.: test for kidney hemorrhage following exposure to intense, pulsed ultrasound, 681
Carstensen, E. L., see Child, S. Z.
Carstensen, E. L., see Hartman, C.
Cathignol, D., see Lewin, P. A.

Cavitation
a novel method to control P+/P− ratio of shock wave pulses used in the extracorporeal piezoelectric lithotripsy (EPL) (Lewin), 473
biological effects of shock waves: cavitation by shock waves in piglet liver (Delius), 467
biological effects of shock waves: cell disruption, viability, and proliferation of L1210 cells exposed to shock waves *in vitro* (Gambihler), 587
confirmation of an ultrasound-induced mutation in two *in vitro* mammalian cell lines (Doida), 699
effects of lithotripter fields on development of chick embryos (Hartman), 581
influence of the shock wave application mode on the growth of A-Mel 3 and SSK2 tumours *in vivo* (Weiss), 595
killing of *Drosophila* larvae by the fields of an electrohydraulic lithotripter (Carstensen), 687
lung damage from exposure to pulsed ultrasound (Child), 817
lung damage from exposure to the fields of an electrohydraulic lithotripter (Hartman), 675
lysis of cells in *Elodea* leaves by pulsed and continuous wave ultrasound (Carstensen), 167

test for kidney hemorrhage following exposure to intense, pulsed ultrasound (Carstensen), 681

Cell lysis
lysis of cells in *Elodea* leaves by pulsed and continuous wave ultrasound (Carstensen), 167

Cell morphology
time lapse and microscopic examinations of insonated *in vitro* cells (Miller), 73

Cell motility
time lapse and microscopic examinations of insonated *in vitro* cells (Miller), 73

Cells
biological effects of shock waves: cell disruption, viability, and proliferation of L1210 cells exposed to shock waves *in vitro* (Gambihler), 587
confirmation of an ultrasound-induced mutation in two *in vitro* mammalian cell lines (Doida), 699
lysis of cells in *Elodea* leaves by pulsed and continuous wave ultrasound (Carstensen), 167
macrophage responsiveness to therapeutic ultrasound (Young), 809
time lapse and microscopic examinations of insonated *in vitro* cells (Miller), 73

Cerebral artery
a validation study on the reproducibility of transcranial Doppler velocimetry (Maeda), 9
transcranial pulsed Doppler measurements of blood flow velocity in the middle cerebral artery: reference values at rest and during hyperventilation in healthy children and adolescents in relation to age and sex (Brouwers), 1

Cerri, G. G.: unusual manifestations of biliary tract ascariasis, 725L

Cesarean section
observation of Cesarean section scar by transvaginal ultrasonography (Chen), 443

Cespedes, I. and Ophir, J.: diffraction correction methods for pulse-echo acoustic attenuation estimation, 707
Chapelon, J.-Y., see Lewin, P. A.
Chen, H.-Y., Chen, S.-J. and Hsieh, F.-J.: observation of Cesarean section scar by transvaginal ultrasonography, 443
Chen, S.-J., see Chen, H.-Y.
Chiang, E. H., see Carson, P. L.
Chiba, Y., Kanzaki, T., Kobayashi, H., Murakami, M. and Yutani, C.: evaluation of fetal structural heart disease using color flow mapping, 221

Chick embryos
effects of lithotripter fields on development of chick embryos (Hartman), 581

Child, S. Z., Hartman, C. L., Schery, L. A. and Carstensen, E. L.: lung damage from exposure to pulsed ultrasound, 817
Child, S. Z., see Carstensen, E. L.
Child, S. Z., see Carstensen, E. L.
Child, S. Z., see Carstensen, E. L.
Child, S. Z., see Hartman, C.
Child, S. Z., see Hartman, C.

Children
transcranial pulsed Doppler measurements of blood flow velocity in the middle cerebral artery: reference values at rest and during hyperventilation in healthy children and adolescents in relation to age and sex (Brouwers), 1

Chorionic villus sampling
uterine bloodflow velocity waveforms before and after transcervical chorionic villus sampling (Cohen-Overbeek), 129

Church, C. C. and Miller, D. L.: shock wave lithotripsy produces large cavitation bubbles, 626L
Church, C. C., see Doida, Y.
Church, C. C., see Miller, M. W.
Ciaravino, V., see Miller, M. W.

Clinical evaluation
clinical performance of a cone/annular array ultrasound breast scanner (Fishell), 361

Cloutier, G., Lemire, F., Durand, L.-G., Latour, Y. and Langlois, Y. E.: computer evaluation of Doppler spectral envelope area in patients having a valvular aortic stenosis, 247

CO_2-reactivity
relationship between pulsatility indices of Doppler flow signals and CO_2-reactivity within the middle cerebral artery in extracranial occlusive disease (Ley-Pozo), 763

Cobbold, R. S. C., see Bascom, P. A. J.
Cohen-Overbeek, T. E., Jahoda, M. G. J. and Wladimiroff, J. W.: uterine bloodflow velocity waveforms before and after transcervical chorionic villus sampling, 129

Collagen
ultrasonic assessment of skin and surgical wounds utilizing backscatter acoustic techniques to estimate attenuation (Forster), 43

Color flow
Doppler color flow in echocardiography: analytical and *in vitro* investigations of the quantitative relationship between orifice flow and color jet dimensions (Holen), 543
Doppler ultrasound color flow imaging in the study of breast cancer: preliminary findings (Adler), 553
evaluation of fetal structural heart disease using color flow mapping (Chiba), 221
on the behaviour of instantaneous frequency estimators implemented on Doppler flow imagers (Nowicki), 511
the assessment of abnormal pelvic blood flow by transvaginal color and pulsed Doppler (Kurjak), 437
visualization of calf veins by color flow imaging (van Bemmelen), 15

Condra, K. A., see Rubin, M. J.

Cone/annular array
clinical performance of a cone/annular array ultrasound breast scanner (Fishell), 361

Congenital heart disease
evaluation of fetal structural heart disease using color flow mapping (Chiba), 221

Connor, T., see Fishell, E. K.

Continuous-wave Doppler
a comparison of the Doppler spectra from human blood and artificial blood used in a flow phantom (Hoskins), 141
Doppler color flow in echocardiography: analytical and *in vitro* investigations of the quantitative relationship between orifice flow and color jet dimensions (Holen), 543
estimation of aortic and pulmonary blood flow in a paediatric population using Doppler ultrasound: an *in vitro* study (Soul), 659
site-dependent effects of increases in placental vascular resistance on the umbilical arterial velocity waveform in fetal sheep (Adamson), 19

Contrast
a comparison of the Doppler spectra from human blood and artificial blood used in a flow phantom (Hoskins), 141
site-dependent effects of increases in placental vascular resistance on the umbilical arterial velocity waveform in fetal sheep (Adamson), 19

Correlation
on the behaviour of instantaneous frequency estimators implemented on Doppler flow imagers (Nowicki), 511
quantitative tissue motion analysis of digitized M-mode images: gestational differences of fetal lung (Adler), 561

Courtois, M., see Barzilai, B.
Cox, C., see Doida, Y.
Cox, C. A., see Carstensen, E. L.
Cox, C. A., see Hartman, C.
Cox, C. F., see Hartman, C.
Crane, C., see Carstensen, E. L.

Crossed beam method
an evaluation of an *in vivo* local sound speed estimation by the crossed beam method (Kondo), 65

D

Dadd, M. J., see Wilson, L. S.
Deane, C., Walters, H. and Taube, D.: colour duplex ultrasound diagnosis of venous stenoses in renal allografts, 313L
Debel, J. R., see Olerud, J. E.
Debruyne, F. M. J., see Hendrikx, A. J. M.

Deep vein thrombosis
intraoperative venous dilation and subsequent development of deep vein thrombosis in patients undergoing total hip or knee replacement (Stewart), 133

Delius, M., Denk, R., Berding, C., Liebach, H.-G., Jordan, M. and Brendel, W.: biological effects of shock waves: cavitation by shock waves in piglet liver, 467

Delius, M., Jordan, M., Liebach, H.-G. and Brendel, W.: biological effects of shock waves: effect of shock waves on the liver and gallbladder wall of dogs—administration rate dependence, 459
Delius, M., see Gambihler, S.
Delius, M., see Weiss, N.
Denk, R., see Delius, M.

Descending thoracic aorta
fetal Doppler shift waveforms in intrauterine growth retardation: Laplace transform analysis technique (Stone), 773

Diagnosis
prenatal diagnosis by ultrasound in pregnancies at risk for autosomal recessive polycystic kidney disease (Reuss), 355

Diffraction correction
diffraction correction methods for pulse-echo acoustic attenuation estimation (Cespedes), 707

Digital processing
computer evaluation of Doppler spectral envelope area in patients having a valvular aortic stenosis (Cloutier), 247
quantitative tissue motion analysis of digitized M-mode images: gestational differences of fetal lung (Adler), 561

van Dijk, M. A. A. M., see Hendrikx, A. J. M.
Dirschedle, P., see Weiss, N.

Discrete Fourier transform
a comparison of three different filters for speckle reduction of Doppler spectra (Hoskins), 375

Distensibility
assessment of the distensibility of superficial arteries (Hoeks), 121

Dog
biological effects of shock waves: effect of shock waves on the liver and gallbladder wall of dogs—administration rate dependence (Delius), 459

Doida, Y., Miller, M. W., Cox, C. and Church, C. C.: confirmation of an ultrasound-induced mutation in two *in vitro* mammalian cell lines, 699

Doppler
a comparison of the Doppler spectra from human blood and artificial blood used in a flow phantom (Hoskins), 141
a comparison of three different filters for speckle reduction of Doppler spectra (Hoskins), 375
a simulation of transit time effects in Doppler ultrasound signals (Jones), 607
a validation study on the reproducibility of transcranial Doppler velocimetry (Maeda), 9
assessment of the distensibility of superficial arteries (Hoeks), 121
automatic vessel tracking and measurement for Doppler studies (Wilson), 645
computer evaluation of Doppler spectral envelope area in patients having a valvular aortic stenosis (Cloutier), 247

Doppler color flow in echocardiography: analytical and *in vitro* investigations of the quantitative relationship between orifice flow and color jet dimensions (Holen), 543
Doppler ultrasound color flow imaging in the study of breast cancer: preliminary findings (Adler), 553
Doppler waveform pulsatility index and resistance, pressure and flow in the umbilical placental circulation: an investigation using a mathematical model (Thompson), 449
effects of transducer beam geometry and flow velocity profile on the Doppler power spectrum: a theoretical study (Bascom), 279
estimation of aortic and pulmonary blood flow in a paediatric population using Doppler ultrasound: an *in vitro* study (Soul), 659
evaluation of fetal structural heart disease using color flow mapping (Chiba), 221
fetal Doppler shift waveforms in intrauterine growth retardation: Laplace transform analysis technique (Stone), 773
inter- and intra-observer variability of Doppler peak velocity measurements: an *in vitro* study (Tessler), 653
morphological characterization of carotid artery stenoses by ultrasound duplex scanning (Widder), 349
on the behaviour of instantaneous frequency estimators implemented on Doppler flow imagers (Nowicki), 511
selection of the order of autoregressive models for spectral analysis of Doppler ultrasound signals (Schlindwein), 81
site-dependent effects of increases in placental vascular resistance on the umbilical arterial velocity waveform in fetal sheep (Adamson), 19
''sonoelasticity'' images derived from ultrasound signals in mechanically vibrated tissues (Lerner), 231
the assessment of abnormal pelvic blood flow by transvaginal color and pulsed Doppler (Kurjak), 437
the use of a Diasonics DRF400 duplex ultrasound scanner to measure volume flow in arterio-venous fistulae in patients undergoing haemodialysis: an analysis of measurement uncertainties (Oates), 571
tissue response to mechanical vibrations for ''sonoelasticity imaging'' (Parker), 241
transcranial Doppler sonography: anatomical landmarks and normal velocity values (Ringelstein), 745
transcranial pulsed Doppler measurements of blood flow velocity in the middle cerebral artery: reference values at rest and during hyperventilation in healthy children and adolescents in relation to age and sex (Brouwers), 1
uterine bloodflow velocity waveforms before and after transcervical chorionic villus sampling (Cohen-Overbeek), 129

Doppler angle
automatic vessel tracking and measurement for Doppler studies (Wilson), 645
inter- and intra-observer variability of Doppler peak velocity measurements: an *in vitro* study (Tessler), 653
the use of a Diasonics DRF400 duplex ultrasound scanner to measure volume flow in arterio-venous fistulae in patients undergoing haemodialysis: an analysis of measurement uncertainties (Oates), 571

Doppler equation
effects of transducer beam geometry and flow velocity profile on the Doppler power spectrum: a theoretical study (Bascom), 279

Drosophila
killing of *Drosophila* larvae by the fields of an electrohydraulic lithotripter (Carstensen), 687

Du, G., see Wu, J.
DuBose, T. J.: standards for the display of Doppler information, 210L

Duplex scanner
a triangulation method for the quantitative measurement of arterial blood velocity magnitude and direction in humans (Schrank), 499
estimation of aortic and pulmonary blood flow in a paediatric population using Doppler ultrasound: an *in vitro* study (Soul), 659
inter- and intra-observer variability of Doppler peak velocity measurements: an *in vitro* study (Tessler), 653
morphological characterization of carotid artery stenoses by ultrasound duplex scanning (Widder), 349
uterine bloodflow velocity waveforms before and after transcervical chorionic villus sampling (Cohen-Overbeek), 129

Durand, L.-G., see Cloutier, G.
Dyson, M., see Young, S. R.
Dyson, M., see Young, S. R.

E

Echo texture
histological analysis of ultrasonic images of the prostate: an accurate technique (Hendrikx), 667

Echo tracking
automatic vessel tracking and measurement for Doppler studies (Wilson), 645

Echocardiography
Doppler color flow in echocardiography: analytical and *in vitro* investigations of the quantitative relationship between orifice flow and color jet dimensions (Holen), 543
myocardial ultrasonic backscatter for characterization of ischemia and reperfusion: relationship to wall motion (Barzilai), 391

Ectopic pregnancy
the assessment of abnormal pelvic blood flow by transvaginal color and pulsed Doppler (Kurjak), 437

Eden. A.: Doppler or doppler?, 827L
Eden, A.: the Doppler family, 831L

Edge shadow artifact
effect of scan format on refraction artifacts (Ziskin), 183

Elasticity
tissue response to mechanical vibrations for "sonoelasticity imaging" (Parker), 241

Elodea
lysis of cells in *Elodea* leaves by pulsed and continuous wave ultrasound (Carstensen), 167

Embolization
site-dependent effects of increases in placental vascular resistance on the umbilical arterial velocity waveform in fetal sheep (Adamson), 19

Embryonic death
effects of lithotripter fields on development of chick embryos (Hartman), 581

Energy density
estimation of the temperature increase in the focus of a lithotripter for the case of high rate administration (Filipczynski), 149 (see also 727L)

Enwemeka, C. S., Rodriguez, O. and Mendosa, S.: the biochemical effects of low intensity ultrasound on healing tendons, 801

Ergotamine
determination of the luminal diameter of the radial artery in man by high frequency ultrasound: a methodological study (Nielsen), 787

Errors
automatic vessel tracking and measurement for Doppler studies (Wilson), 645
effects of transducer beam geometry and flow velocity profile on the Doppler power spectrum: a theoretical study (Bascom), 279
estimation of aortic and pulmonary blood flow in a paediatric population using Doppler ultrasound: an *in vitro* study (Soul), 659
inter- and intra-observer variability of Doppler peak velocity measurements: an *in vitro* study (Tessler), 653
the use of a Diasonics DRF400 duplex ultrasound scanner to measure volume flow in arterio-venous fistulae in patients undergoing haemodialysis: an analysis of measurement uncertainties (Oates), 571

Etani, H., see Maeda, H.
Etchison, M. R., see Rubin, M. J.
Etienne, J., see Filipczynski, L.
Evans, D. H., see Schlindwein, F. S.

Excitability
temporally-specific modification of myelinated axon excitability *in vitro* following a single ultrasound pulse (Mihran), 297

Extracorporeal shock wave lithotripsy
a novel method to control P+/P− ratio of shock wave pulses used in the extracorporeal piezoelectric lithotripsy (EPL) (Lewin), 473
biological effects of shock waves: cavitation by shock waves in piglet liver (Delius), 467
biological effects of shock waves: cell disruption, viability, and proliferation of L1210 cells exposed to shock waves *in vitro* (Gambihler), 587
biological effects of shock waves: effect of shock waves on the liver and gallbladder wall of dogs—administration rate dependence (Delius), 459
capacitance hydrophones for pressure determination in lithotripsy (Filipczynski), 157
effects of lithotripter fields on development of chick embryos (Hartman), 581
estimation of the temperature increase in the focus of a lithotripter for the case of high rate administration (Filipczynski), 149 (see also 727L)
influence of the shock wave application mode on the growth of A-Mel 3 and SSK2 tumours *in vivo* (Weiss), 595

killing of *Drosophila* larvae by the fields of an electrohydraulic lithotripter (Carstensen), 687
lung damage from exposure to the fields of an electrohydraulic lithotripter (Hartman), 675

F

Faix, R. G., see Carson, P. L.

Fetal anomalies
evaluation of fetal structural heart disease using color flow mapping (Chiba), 221
prenatal diagnosis by ultrasound in pregnancies at risk for autosomal recessive polycystic kidney disease (Reuss), 355
ultrasound attenuation coefficient in the fetal liver as a function of gestational age (Carson), 399

Fetal blood flow
fetal Doppler shift waveforms in intrauterine growth retardation: Laplace transform analysis technique (Stone), 773

Fetal development
fetal Doppler shift waveforms in intrauterine growth retardation: Laplace transform analysis technique (Stone), 773
ultrasound attenuation coefficient in the fetal liver as a function of gestational age (Carson), 399

Fetal lung
quantitative tissue motion analysis of digitized M-mode images: gestational differences of fetal lung (Adler), 561

Fetal renal malformation
prenatal diagnosis by ultrasound in pregnancies at risk for autosomal recessive polycystic kidney disease (Reuss), 355

Fetus
effects of lithotripter fields on development of chick embryos (Hartman), 581
evaluation of fetal structural heart disease using color flow mapping (Chiba), 221
fetal Doppler shift waveforms in intrauterine growth retardation: Laplace transform analysis technique (Stone), 773
prenatal diagnosis by ultrasound in pregnancies at risk for autosomal recessive polycystic kidney disease (Reuss), 355
quantitative tissue motion analysis of digitized M-mode images: gestational differences of fetal lung (Adler), 561
site-dependent effects of increases in placental vascular resistance on the umbilical arterial velocity waveform in fetal sheep (Adamson), 19
ultrasound attenuation coefficient in the fetal liver as a function of gestational age (Carson), 399
uterine bloodflow velocity waveforms before and after transcervical chorionic villus sampling (Cohen-Overbeek), 129

Fibroblasts
macrophage responsiveness to therapeutic ultrasound (Young), 809
time lapse and microscopic examinations of insonated *in vitro* cells (Miller), 73

Filipczynski, L. and Etienne, J.: capacitance hydrophones for pressure determination in lithotripsy, 157
Filipczynski, L. and Piechocki, M.: estimation of the temperature increase in the focus of a lithotripter for the case of high rate administration, 149
Filipczynksi, L. and Piechocki, M.: estimation of the temperature increase in the focus of a lithotripter for the case of high rate administration, 727L

Finite amplitude
capacitance hydrophones for pressure determination in lithotripsy (Filipczynski), 157

Finite element analysis
tissue response to mechanical vibrations for "sonoelasticity imaging" (Parker), 241

Fishell, E. K., Foster, F. S., Connor, T., Khodai, M., Harasciewicz, K. and Hunt, J. W.: clinical performance of a cone/annular array ultrasound breast scanner, 361

Flow rig
a comparison of the Doppler spectra from human blood and artificial blood used in a flow phantom (Hoskins), 141
Doppler color flow in echocardiography: analytical and *in vitro* investigations of the quantitative relationship between orifice flow and color jet dimensions (Holen), 543
estimation of aortic and pulmonary blood flow in a paediatric population using Doppler ultrasound: an *in vitro* study (Soul), 659
inter- and intra-observer variability of Doppler peak velocity measurements: an *in vitro* study (Tessler), 653
the use of a Diasonics DRF400 duplex ultrasound scanner to measure volume flow in arterio-venous fistulae in patients undergoing haemodialysis: an analysis of measurement uncertainties (Oates), 571

Focused ultrasound
a novel method to control P+/P− ratio of shock wave pulses used in the extracorporeal piezoelectric lithotripsy (EPL) (Lewin), 473
test for kidney hemorrhage following exposure to intense, pulsed ultrasound (Carstensen), 681

Forster, F. K., Olerud, J. E., Riederer-Henderson, M. A. and Holmes, A. W.: ultrasonic assessment of skin and surgical wounds utilizing backscatter acoustic techniques to estimate attenuation, 43
Foster, F. S.: reply to "validation of annular array technology," 312L
Foster, F. S., see Fishell, E. K.

Fourier transform
a comparison of three different filters for speckle reduction of Doppler spectra (Hoskins), 375
ultrasonic imaging of the nonlinear parameter B/A: simulation studies to evaluate phase and frequency modulation methods (Kim), 175

Franklin, Jr., T. D., see Rubin, M. J.

Frequency estimation
computer evaluation of Doppler spectral envelope area in patients having a valvular aortic stenosis (Cloutier), 247

on the behaviour of instantaneous frequency estimators implemented on Doppler flow imagers (Nowicki), 511
ultrasonic imaging of the nonlinear parameter B/A: simulation studies to evaluate phase and frequency modulation methods (Kim), 175

Frog
temporally-specific modification of myelinated axon excitability *in vitro* following a single ultrasound pulse (Mihran), 297

Fukanaga, R., see Maeda, H.

G

Gall bladder
biological effects of shock waves: effect of shock waves on the liver and gallbladder wall of dogs—administration rate dependence (Delius), 459

Gambihler, S., Delius, M. and Brendel, W.: biological effects of shock waves: cell disruption, viability, and proliferation of L1210 cells exposed to shock waves *in vitro*, 587
Gambihler, S., see Weiss, N.

Gas bubbles
lysis of cells in *Elodea* leaves by pulsed and continuous wave ultrasound (Carstensen), 167

Gender
transcranial pulsed Doppler measurements of blood flow velocity in the middle cerebral artery: reference values at rest and during hyperventilation in healthy children and adolescents in relation to age and sex (Brouwers), 1

Giddens, D. P., see Jones, S. A.
Gill, R. W., see Wilson, L. S.

Gluconeogenesis
ultrasound attenuation coefficient in the fetal liver as a function of gestational age (Carson), 399

Glycogen
ultrasound attenuation coefficient in the fetal liver as a function of gestational age (Carson), 399

Goetz, A., see Weiss, N.
Grant, E. G., see Tessler, F. N.
Greenleaf, J. F., see Kim, D.

Growth factors
macrophage responsiveness to therapeutic ultrasound (Young), 809

Guidance
operative ultrasound guidance for various surgical procedures (Machi), 37

H

Hackspacher, J., see Widder, B.

Haemodialysis
the use of a Diasonics DRF400 duplex ultrasound scanner to measure volume flow in arterio-venous fistulae in patients undergoing haemodialysis: an analysis of measurement uncertainties (Oates), 571

Hamann, H., see Widder, B.
Hames, T. K., see Soul, F. J.
Handa, N., see Maeda, H.
Harasciewicz, K., see Fishell, E. K.
Hartman, C., Child, S. Z., Mayer, R., Schenk, E. and Carstensen, E. L.: lung damage from exposure to the fields of an electrohydraulic lithotripter, 675
Hartman, C., Cox, C. A., Brewer, L., Child, S. Z., Cox, C. F. and Carstensen, E. L.: effects of lithotripter fields on development of chick embryos, 581
Hartman, C., see Carstensen, E. L.
Hartman, C. L., see Child, S. Z.
van Helvoort-van Dommelen, C. A. M., see Hendrikx, A. J. M.
Hendrikx, A. J. M., de la Rosette, J. J. M. C. H., van Helvoort-van Dommelen, C. A. M., van Dijk, M. A. A. M., Semmelink, H., Rijntjes, N. V. M. and Debruyne, F. M. J.: histological analysis of ultrasonic images of the prostate: an accurate technique, 667

High pass filter
effects of transducer beam geometry and flow velocity profile on the Doppler power spectrum: a theoretical study (Bascom), 279

High resolution
clinical performance of a cone/annular array ultrasound breast scanner (Fishell), 361
determination of the luminal diameter of the radial artery in man by high frequency ultrasound: a methodological study (Nielsen), 787

Hirama, M., see Kondo, M.

Histology
histological analysis of ultrasonic images of the prostate: an accurate technique (Hendrikx), 667

Hoeks, A. P. G., Brands, P. J., Smeets, F. A. M. and Reneman, R. S.: assessment of the distensibility of superficial arteries, 121
Hoffman, D., see Carstensen, E. L.
Holen, J., Nanna, M., Lockhart, J. and Waag, R.: Doppler color flow in echocardiography: analytical and *in vitro* investigations of the quantitative relationship between orifice flow and color jet dimensions, 543
Holmes, A. W., see Forster, F. K.
Hoskins, P. R., Loupas, T. and McDicken, W. N.: a comparison of the Doppler spectra from human blood and artificial blood used in a flow phantom, 141
Hoskins, P. R., Loupas, T. and McDicken, W. N.: a comparison of three different filters for speckle reduction of Doppler spectra, 375
Hsieh, F.-J., see Chen, H.-Y.
Huang, S. R., see Lerner, R. M.
Huang, S. R., see Parker, K. J.
van Huffelen, A. C., see Brouwers, P. J. A. M.
Hunt, J. W., see Fishell, E. K.
Hutschenreiter, S., see Widder, B.

Hydrophones
a novel method to control P+/P− ratio of shock wave pulses used in the extracorporeal piezoelectric lithotripsy (EPL) (Lewin), 473
capacitance hydrophones for pressure determination in lithotripsy (Filipczynski), 157

Hynynen, K., see Billard, B. E.

Hyperthermia
effects of physical parameters on high temperature ultrasound hyperthermia (Billard), 409
temperature elevation generated by a focused Gaussian beam of ultrasound (Wu), 489

I

Iinuma, K., see Kondo, M.

Image processing
a comparison of three different filters for speckle reduction of Doppler spectra (Hoskins), 375
automatic vessel tracking and measurement for Doppler studies (Wilson), 645
Doppler color flow in echocardiography: analytical and *in vitro* investigations of the quantitative relationship between orifice flow and color jet dimensions (Holen), 543
histological analysis of ultrasonic images of the prostate: an accurate technique (Hendrikx), 667
quantitative tissue motion analysis of digitized M-mode images: gestational differences of fetal lung (Adler), 561
the effect of therapeutic ultrasound on angiogenesis (Young), 261

Imaging
automatic vessel tracking and measurement for Doppler studies (Wilson), 645
clinical performance of a cone/annular array ultrasound breast scanner (Fishell), 361
determination of the luminal diameter of the radial artery in man by high frequency ultrasound: a methodological study (Nielsen), 787
Doppler color flow in echocardiography: analytical and *in vitro* investigations of the quantitative relationship between orifice flow and color jet dimensions (Holen), 543
Doppler ultrasound color flow imaging in the study of breast cancer: preliminary findings (Adler), 553
effect of scan format on refraction artifacts (Ziskin), 183
histological analysis of ultrasonic images of the prostate: an accurate technique (Hendrikx), 667
morphological characterization of carotid artery stenoses by ultrasound duplex scanning (Widder), 349
observation of Cesarean section scar by transvaginal ultrasonography (Chen), 443
prenatal diagnosis by ultrasound in pregnancies at risk for autosomal recessive polycystic kidney disease (Reuss), 355
"sonoelasticity" images derived from ultrasound signals in mechanically vibrated tissues (Lerner), 231
the assessment of abnormal pelvic blood flow by transvaginal color and pulsed Doppler (Kurjak), 437
ultrasonic imaging of the nonlinear parameter B/A: simulation studies to evaluate phase and frequency modulation methods (Kim), 175
ultrasound attenuation coefficient in the fetal liver as a function of gestational age (Carson), 399
visualization of calf veins by color flow imaging (van Bemmelen), 15

In vitro *irradiation*
biological effects of shock waves: cell disruption, viability, and proliferation of L1210 cells exposed to shock waves *in vitro* (Gambihler), 587

confirmation of an ultrasound-induced mutation in two *in vitro* mammalian cell lines (Doida), 699
effects of lithotripter fields on development of chick embryos (Hartman), 581
effects of physical parameters on high temperature ultrasound hyperthermia (Billard), 409
macrophage responsiveness to therapeutic ultrasound (Young), 809
protein synthesis stimulated in sonicated sugar beet cells and protoplasts (Joersbo), 719
temporally-specific modification of myelinated axon excitability *in vitro* following a single ultrasound pulse (Mihran), 297
time lapse and microscopic examinations of insonated *in vitro* cells (Miller), 73

In vivo *irradiation*
acute effects of ultrasound on skeletal muscle oxygen tension, blood flow and capillary density (Rubin), 271
biological effects of shock waves: cavitation by shock waves in piglet liver (Delius), 467
biological effects of shock waves: effect of shock waves on the liver and gallbladder wall of dogs—administration rate dependence (Delius), 459
effects of physical parameters on high temperature ultrasound hyperthermia (Billard), 409
influence of the shock wave application mode on the growth of A-Mel 3 and SSK2 tumours *in vivo* (Weiss), 595
killing of *Drosophila* larvae by the fields of an electrohydraulic lithotripter (Carstensen), 687
lung damage from exposure to pulsed ultrasound (Child), 817
lung damage from exposure to the fields of an electrohydraulic lithotripter (Hartman), 675
lysis of cells in *Elodea* leaves by pulsed and continuous wave ultrasound (Carstensen), 167
test for kidney hemorrhage following exposure to intense, pulsed ultrasound (Carstensen), 681
the biochemical effects of low intensity ultrasound on healing tendons (Enwemeka), 801
the effect of therapeutic ultrasound on angiogenesis (Young), 261

Instantaneous frequency detector (IFD)
a simulation of transit time effects in Doppler ultrasound signals (Jones), 607
on the behaviour of instantaneous frequency estimators implemented on Doppler flow imagers (Nowicki), 511

Integrated backscatter
myocardial ultrasonic backscatter for characterization of ischemia and reperfusion: relationship to wall motion (Barzilai), 391
ultrasonic myocardial integrated backscatter and myocardial wall thickness in animal experiments (Rijsterborgh), 29

Interobserver error
a validation study on the reproducibility of transcranial Doppler velocimetry (Maeda), 9
determination of the luminal diameter of the radial artery in man by high frequency ultrasound: a methodological study (Nielsen), 787
inter- and intra-observer variability of Doppler peak velocity measurements: an *in vitro* study (Tessler), 653

Intraoperative ultrasound
intraoperative venous dilation and subsequent development of deep vein thrombosis in patients undergoing total hip or knee replacement (Stewart), 133
operative ultrasound guidance for various surgical procedures (Machi), 37

Intraplaque hemorrhage
morphological characterization of carotid artery stenoses by ultrasound duplex scanning (Widder), 349

Inverse diffraction filtering
diffraction correction methods for pulse-echo acoustic attenuation estimation (Cespedes), 707

Inverse Fourier transform
ultrasonic imaging of the nonlinear parameter B/A: simulation studies to evaluate phase and frequency modulation methods (Kim), 175

Irradiation
acute effects of ultrasound on skeletal muscle oxygen tension, blood flow and capillary density (Rubin), 271
biological effects of shock waves: cavitation by shock waves in piglet liver (Delius), 467
biological effects of shock waves: cell disruption, viability, and proliferation of L1210 cells exposed to shock waves *in vitro* (Gambihler), 587
biological effects of shock waves: effect of shock waves on the liver and gallbladder wall of dogs—administration rate dependence (Delius), 459
confirmation of an ultrasound-induced mutation in two *in vitro* mammalian cell lines (Doida), 699
effects of lithotripter fields on development of chick embryos (Hartman), 581
effects of physical parameters on high temperature ultrasound hyperthermia (Billard), 409
influence of the shock wave application mode on the growth of A-Mel 3 and SSK2 tumours *in vivo* (Weiss), 595
killing of *Drosophila* larvae by the fields of an electrohydraulic lithotripter (Carstensen), 687
lung damage from exposure to pulsed ultrasound (Child), 817
lung damage from exposure to the fields of an electrohydraulic lithotripter (Hartman), 675
lysis of cells in *Elodea* leaves by pulsed and continuous wave ultrasound (Carstensen), 167
macrophage responsiveness to therapeutic ultrasound (Young), 809
protein synthesis stimulated in sonicated sugar beet cells and protoplasts (Joersbo), 719
temporally-specific modification of myelinated axon excitability *in vitro* following a single ultrasound pulse (Mihran), 297
test for kidney hemorrhage following exposure to intense, pulsed ultrasound (Carstensen), 681
the biochemical effects of low intensity ultrasound on healing tendons (Enwemeka), 801
the effect of therapeutic ultrasound on angiogenesis (Young), 261
time lapse and microscopic examinations of insonated *in vitro* cells (Miller), 73

Isaka, Y., see Maeda, H.

Ischemia
myocardial ultrasonic backscatter for characterization of ischemia and reperfusion: relationship to wall motion (Barzilai), 391

Iversen, H. K., see Nielsen, T. H.

J

Jahoda, M. G. J., see Cohen-Overbeek, T. E.
Jensen, K., see Stewart, G. J.

Jet streams
Doppler color flow in echocardiography: analytical and *in vitro* investigations of the quantitative relationship between orifice flow and color jet dimensions (Holen), 543

Joersbo, M. and Brunstedt, J.: protein synthesis stimulated in sonicated sugar beet cells and protoplasts, 719
Jones, S. A. and Giddens, D. P.: a simulation of transit time effects in Doppler ultrasound signals, 607
Jordan, M., see Delius, M.
Jordan, M., see Delius, M.
Jurkovic, D., see Kurjak, A.

K

Kahlscheuer, B., see Ringelstein, E. B.
Kamada, T., see Maeda, H.
Kanzaki, T., see Chiba, Y.
Khodai, M., see Fishell, E. K.

Kidney
estimation of the temperature increase in the focus of a lithotripter for the case of high rate administration (Filipczynski), 149 (see also 727L)
test for kidney hemorrhage following exposure to intense, pulsed ultrasound (Carstensen), 681

Kim, B.-H., see Maeda, H.
Kim, D., Greenleaf, J. F. and Sehgal, C. M.: ultrasonic imaging of the nonlinear parameter B/A: simulation studies to evaluate phase and frequency modulation methods, 175
Kimme-Smith, C., see Tessler, F. N.
Kimura, K., see Maeda, H.
Kinoshita, N., see Maeda, H.
Kobayashi, H., see Chiba, Y.
Kondo, M., Takamizawa, K., Hirama, M., Okazaki, K., Iinuma, K. and Takehara, Y.: an evaluation of an *in vivo* local sound speed estimation by the crossed beam method, 65
Kremkau, F.: calculation of Vmax incorporating dynamic range and attenuation, 522L
Kremkau, F.: Doppler angle error due to refraction, 523L
Kremkau, F.: Doppler or doppler?, 524L
Kremkau, F.: source of Doppler shift in blood flow, 421L
Kremkau, F.: source of double Doppler shift in blood flow, 519L
Kreutzer, C., see Widder, B.
Kurjak, A., Zalud, I., Alfirevic, Z. and Jurkovic, D.: the assessment of abnormal pelvic blood flow by transvaginal color and pulsed Doppler, 437
Kurohiji, T., see Machi, J.

L

L1210 cells
biological effects of shock waves: cell disruption, viability, and proliferation of L1210 cells exposed to shock waves *in vitro* (Gambihler), 587

Lachman, J. W., see Stewart, G. J.
LaFollette, Jr., P. S., see Ziskin, M. C.

Laminar flow
estimation of aortic and pulmonary blood flow in a paediatric population using Doppler ultrasound: an *in vitro* study (Soul), 659

Lancee, C. T., see Rijsterborgh, H.
Langille, B. L., see Adamson, S. L.
Langlois, Y. E., see Cloutier, G.

Laplace transform
fetal Doppler shift waveforms in intrauterine growth retardation: Laplace transform analysis technique (Stone), 773

Latour, Y., see Cloutier, G.
Lemire, F., see Cloutier, G.
Lerner, R. M., Huang, S. R. and Parker, K. J.: "sonoelasticity" images derived from ultrasound signals in mechanically vibrated tissues, 231
Lerner, R. M., see Parker, K. J.
Lewin, P. A., Chapelon, J.-Y., Mestas, J.-L., Birer, A. and Cathignol, D.: a novel method to control P+/P− ratio of shock wave pulses used in the extracorporeal piezoelectric lithotripsy (EPL), 473
Ley-Pozo, J., Willmes, K. and Ringelstein, E. B.: relationship between pulsatility indices of Doppler flow signals and CO_2-reactivity within the middle cerebral artery in extracranial occlusive disease, 763
Liebach, H.-G., see Delius, M.
Liebach, H.-G., see Delius, M.
Light, L. H.: effect of selective tissue attenuation on pulsed Doppler frequency, 317L

Light microscopy
time lapse and microscopic examinations of insonated *in vitro* cells (Miller), 73

Linker, D. T., Angelsen, B. A. J. and Popp, R. L.: autocorrelation length of normal and myopathic human myocardium measured by acoustic microscopy: implications for clinical ultrasonic tissue characterization, 793

Lithotripsy
a novel method to control P+/P− ratio of shock wave pulses used in the extracorporeal piezoelectric lithotripsy (EPL) (Lewin), 473
biological effects of shock waves: cavitation by shock waves in piglet liver (Delius), 467
biological effects of shock waves: cell disruption, viability, and proliferation of L1210 cells exposed to shock waves *in vitro* (Gambihler), 587
biological effects of shock waves: effect of shock waves on the liver and gallbladder wall of dogs—administration rate dependence (Delius), 459
capacitance hydrophones for pressure determination in lithotripsy (Filipczynski), 157
effects of lithotripter fields on development of chick embryos (Hartman), 581
estimation of the temperature increase in the focus of a lithotripter for the case of high rate administration (Filipczynski), 149 (see also 727L)

influence of the shock wave application mode on the growth of A-Mel 3 and SSK2 tumours *in vivo* (Weiss), 595
killing of *Drosophila* larvae by the fields of an electrohydraulic lithotripter (Carstensen), 687
lung damage from exposure to the fields of an electrohydraulic lithotripter (Hartman), 675

Liver
an evaluation of an *in vivo* local sound speed estimation by the crossed beam method (Kondo), 65
biological effects of shock waves: cavitation by shock waves in piglet liver (Delius), 467
biological effects of shock waves: effect of shock waves on the liver and gallbladder wall of dogs—administration rate dependence (Delius), 459
ultrasound attenuation coefficient in the fetal liver as a function of gestational age (Carson), 399

Lockhart, J., see Holen, J.
Loupas, T., see Hoskins, P. R.
Loupas, T., see Hoskins, P. R.

Luminal diameter
determination of the luminal diameter of the radial artery in man by high frequency ultrasound: a methodological study (Nielsen), 787

Lung
lung damage from exposure to pulsed ultrasound (Child), 817
lung damage from exposure to the fields of an electrohydraulic lithotripter (Hartman), 675

M

Machi, J., Sigel, B., Kurohiji, T., Zaren, H. A. and Sariego, J.: operative ultrasound guidance for various surgical procedures, 37

Macrophages
macrophage responsiveness to therapeutic ultrasound (Young), 809

Maeda, H., Etani, H., Handa, N., Tagaya, M., Oku, N., Kim, B-H., Naka, M., Kinoshita, N., Nukada, T., Fukanaga, R., Isaka, Y., Matsumoto, M., Kimura, K. and Kamada, T.: a validation study on the reproducibility of transcranial Doppler velocimetry, 9

Mapping
an evaluation of an *in vivo* local sound speed estimation by the crossed beam method (Kondo), 65

Marks, T. I., see Carson, P. L.
Mastik, F., see Rijsterborgh, H.
Matsumoto, M., see Maeda, H.

Maximum frequency shift
effects of transducer beam geometry and flow velocity profile on the Doppler power spectrum: a theoretical study (Bascom), 279
inter- and intra-observer variability of Doppler peak velocity measurements: an *in vitro* study (Tessler), 653

Maximum velocity
inter- and intra-observer variability of Doppler peak velocity measurements: an *in vitro* study (Tessler), 653

Mayer, R., see Carstensen, E. L.
Mayer, R., see Hartman, C.
McDicken, W. N., see Hoskins, P. R.
McDicken, W. N., see Hoskins, P. R.
McHugh, M. I., see Oates, C. P.
Mendosa, S., see Enwemeka, C. S.
Mestas, J.-L., see Lewin, P. A.

Metabolic disease
ultrasound attenuation coefficient in the fetal liver as a function of gestational age (Carson), 399

Meyer, C. R., see Carson, P. L.

Mice
lung damage from exposure to pulsed ultrasound (Child), 817
lung damage from exposure to the fields of an electrohydraulic lithotripter (Hartman), 675
test for kidney hemorrhage following exposure to intense, pulsed ultrasound (Carstensen), 681

Microradiography
the effect of therapeutic ultrasound on angiogenesis (Young), 261

Microscope
autocorrelation length of normal and myopathic human myocardium measured by acoustic microscopy: implications for clinical ultrasonic tissue characterization (Linker), 793
correlation of tissue constituents with the acoustic properties of skin and wound (Olerud), 55
time lapse and microscopic examinations of insonated *in vitro* cells (Miller), 73

Middle cerebral artery
a validation study on the reproducibility of transcranial Doppler velocimetry (Maeda), 9
transcranial pulsed Doppler measurements of blood flow velocity in the middle cerebral artery: reference values at rest and during hyperventilation in healthy children and adolescents in relation to age and sex (Brouwers), 1

Mihran, R. T., Barnes, F. S. and Wachtel, H.: temporally-specific modification of myelinated axon excitability *in vitro* following a single ultrasound pulse, 297
Miller, J. G., see Barzilai, B.
Miller, M. W., Church, C. C. and Ciaravino, V.: time lapse and microscopic examinations of insonated *in vitro* cells, 73
Miller, M. W., see Carstensen, E. L.
Miller, M. W., see Doida, Y.

Model
a comparison of the Doppler spectra from human blood and artificial blood used in a flow phantom (Hoskins), 141
a simulation of transit time effects in Doppler ultrasound signals (Jones), 607

Doppler waveform pulsatility index and resistance, pressure and flow in the umbilical placental circulation: an investigation using a mathematical model (Thompson), 449
effects of physical parameters on high temperature ultrasound hyperthermia (Billard), 409
effects of transducer beam geometry and flow velocity profile on the Doppler power spectrum: a theoretical study (Bascom), 279
on the behaviour of instantaneous frequency estimators implemented on Doppler flow imagers (Nowicki), 511
selection of the order of autoregressive models for spectral analysis of Doppler ultrasound signals (Schlindwein), 81
temperature elevation generated by a focused Gaussian beam of ultrasound (Wu), 489
ultrasonic imaging of the nonlinear parameter B/A: simulation studies to evaluate phase and frequency modulation methods (Kim), 175

Mohr, G. A., see Barzilai, B.
Moritz, W. E., see Schrank, E.

Morphology
correlation of tissue constituents with the acoustic properties of skin and wound (Olerud), 55
morphological characterization of carotid artery stenoses by ultrasound duplex scanning (Widder), 349

Morrow, R. J., see Adamson, S. L.

Motion
myocardial ultrasonic backscatter for characterization of ischemia and reperfusion: relationship to wall motion (Barzilai), 391
quantitative tissue motion analysis of digitized M-mode images: gestational differences of fetal lung (Adler), 561
"sonoelasticity" images derived from ultrasound signals in mechanically vibrated tissues (Lerner), 231
tissue response to mechanical vibrations for "sonoelasticity imaging" (Parker), 241

Motion artifacts
automatic vessel tracking and measurement for Doppler studies (Wilson), 645

MTT assay
biological effects of shock waves: cell disruption, viability, and proliferation of L1210 cells exposed to shock waves *in vitro* (Gambihler), 587

Murakami, M., see Chiba, Y.
Musbach, M., see Brouwers, P. J. A. M.
Musulin, R. A., see Parker, K. J.

Mutation
confirmation of an ultrasound-induced mutation in two *in vitro* mammalian cell lines (Doida), 699

Myelinated sciatic nerve
temporally-specific modification of myelinated axon excitability *in vitro* following a single ultrasound pulse (Mihran), 297

Myocardial reperfusion
myocardial ultrasonic backscatter for characterization of ischemia and reperfusion: relationship to wall motion (Barzilai), 391

Myocardium
autocorrelation length of normal and myopathic human myocardium measured by acoustic microscopy: implications for clinical ultrasonic tissue characterization (Linker), 793
ultrasonic myocardial integrated backscatter and myocardial wall thickness in animal experiments (Rijsterborgh), 29

N

Naka, M., see Maeda, H.
Nanna, M., see Holen, J.

Needle placement
operative ultrasound guidance for various surgical procedures (Machi), 37

Neovascularization
Doppler ultrasound color flow imaging in the study of breast cancer: preliminary findings (Adler), 553
Nielsen, T. H., Iversen, H. K. and Tfelt-Hansen, P.: determination of the luminal diameter of the radial artery in man by high frequency ultrasound: a methodological study, 787
Niermeijer, M. F., see Reuss, A.
Niggemeyer, E., see Ringelstein, E. B.

Noise
on the behaviour of instantaneous frequency estimators implemented on Doppler flow imagers (Nowicki), 511

Nonaxial blood flow
a triangulation method for the quantitative measurement of arterial blood velocity magnitude and direction in humans (Schrank), 499

Nonlinear acoustic phenomena
a novel method to control P+/P− ratio of shock wave pulses used in the extracorporeal piezoelectric lithotripsy (EPL) (Lewin), 473
ultrasonic imaging of the nonlinear parameter B/A: simulation studies to evaluate phase and frequency modulation methods (Kim), 175

Nonlinear parameter
ultrasonic imaging of the nonlinear parameter B/A: simulation studies to evaluate phase and frequency modulation methods (Kim), 175
Nowicki, A., Reid, J., Pederson, P. C., Schmidt, A. W. and Oung, H.: on the behaviour of instantaneous frequency estimators implemented on Doppler flow imagers, 511
Nukada, T., see Maeda, H.

Nutrition
ultrasound attenuation coefficient in the fetal liver as a function of gestational age (Carson), 399

O

Oates, C. P., Williams, E. D. and McHugh, M. I.: the use of a Diasonics DRF400 duplex ultrasound scanner to measure volume flow in arterio-venous fistulae in patients undergoing haemodialysis: an analysis of measurement uncertainties, 571
O'Brien, Jr., W. D., see Olerud, J. E.

Observer variability
inter- and intra-observer variability of Doppler peak velocity measurements: an *in vitro* study (Tessler), 653

Obstetrics
evaluation of fetal structural heart disease using color flow mapping (Chiba), 221
prenatal diagnosis by ultrasound in pregnancies at risk for autosomal recessive polycystic kidney disease (Reuss), 355
ultrasound attenuation coefficient in the fetal liver as a function of gestational age (Carson), 399
uterine bloodflow velocity waveforms before and after transcervical chorionic villus sampling (Cohen-Overbeek), 129

Odland, G. F., see Olerud, J. E.
Okazaki, K., see Kondo, M.
Oku, N., see Maeda, H.
Olerud, J. E., O'Brien, Jr., W. D., Riederer-Henderson, M. A., Steiger, D. L., Debel, J. R. and Odland, G. F.: correlation of tissue constituents with the acoustic properties of skin and wound, 55
Olerud, J. E., see Forster, F. K.

Operation
operative ultrasound guidance for various surgical procedures (Machi), 37

Ophir, J. and Parker, K. J.: contrast agents in diagnostic ultrasound, 209L
Ophir, J., see Cespedes, I.

Orifice flow rate
Doppler color flow in echocardiography: analytical and *in vitro* investigations of the quantitative relationship between orifice flow and color jet dimensions (Holen), 543

Otis, S. M., see Ringelstein, E. B.
Ott, F., see Widder, B.
Oung, H., see Nowicki, A.

P

Parker, K. J., Huang, S. R., Musulin, R. A. and Lerner, R. M.: tissue response to mechanical vibrations for "sonoelasticity imaging," 241
Parker, K. J., see Carstensen, E. L.
Parker, K. J., see Lerner, R. M.
Paulat, K., see Widder, B.
Pederson, P. C., see Nowicki, A.

Pelvic circulation
the assessment of abnormal pelvic blood flow by transvaginal color and pulsed Doppler (Kurjak), 437

Pelvic mass
the assessment of abnormal pelvic blood flow by transvaginal color and pulsed Doppler (Kurjak), 437

Perez, J. E., see Barzilai, B.

Perfusion
Doppler ultrasound color flow imaging in the study of breast cancer: preliminary findings (Adler), 553
effects of physical parameters on high temperature ultrasound hyperthermia (Billard), 409

Perrella, R. R., see Tessler, F. N.

Phantom
a comparison of the Doppler spectra from human blood and artificial blood used in a flow phantom (Hoskins), 141
a simulation of transit time effects in Doppler ultrasound signals (Jones), 607
diffraction correction methods for pulse-echo acoustic attenuation estimation (Cespedes), 707
estimation of aortic and pulmonary blood flow in a paediatric population using Doppler ultrasound: an *in vitro* study (Soul), 659
inter- and intra-observer variability of Doppler peak velocity measurements: an *in vitro* study (Tessler), 653
the use of a Diasonics DRF400 duplex ultrasound scanner to measure volume flow in arterio-venous fistulae in patients undergoing haemodialysis: an analysis of measurement uncertainties (Oates), 571

Pharmacodynamics
determination of the luminal diameter of the radial artery in man by high frequency ultrasound: a methodological study (Nielsen), 787

Phase abberration
diffraction correction methods for pulse-echo acoustic attenuation estimation (Cespedes), 707

Phase modulation
ultrasonic imaging of the nonlinear parameter B/A: simulation studies to evaluate phase and frequency modulation methods (Kim), 175

Philips, C. M., see Stewart, G. J.
Phillips, D. J., see Schrank, E.
Piechocki, M., see Filipczynski, L.

Piezoelectric lithotripsy
a novel method to control P+/P− ratio of shock wave pulses used in the extracorporeal piezoelectric lithotripsy (EPL) (Lewin), 473

Pini, R., Masotti, L. and Devereux, R. B.: validation of annular array technology, 311L

Plant cells
protein synthesis stimulated in sonicated sugar beet cells and protoplasts (Joersbo), 719

Plaque
morphological characterization of carotid artery stenoses by ultrasound duplex scanning (Widder), 349

pO_2
acute effects of ultrasound on skeletal muscle oxygen tension, blood flow and capillary density (Rubin), 271

Polycystic kidney disease
prenatal diagnosis by ultrasound in pregnancies at risk for autosomal recessive polycystic kidney disease (Reuss), 355

Popp, R. L., see Linker, D. T.

Power spectrum
a comparison of the Doppler spectra from human blood and artificial blood used in a flow phantom (Hoskins), 141
effects of transducer beam geometry and flow velocity profile on the Doppler power spectrum: a theoretical study (Bascom), 279
selection of the order of autoregressive models for spectral analysis of Doppler ultrasound signals (Schlindwein), 81

Pregnancy
evaluation of fetal structural heart disease using color flow mapping (Chiba), 221
uterine bloodflow velocity waveforms before and after transcervical chorionic villus sampling (Cohen-Overbeek), 129

Prenatal diagnosis
evaluation of fetal structural heart disease using color flow mapping (Chiba), 221
prenatal diagnosis by ultrasound in pregnancies at risk for autosomal recessive polycystic kidney disease (Reuss), 355
ultrasound attenuation coefficient in the fetal liver as a function of gestational age (Carson), 399

Pressure
a novel method to control P+/P− ratio of shock wave pulses used in the extracorporeal piezoelectric lithotripsy (EPL) (Lewin), 473
biological effects of shock waves: cavitation by shock waves in piglet liver (Delius), 467
biological effects of shock waves: cell disruption, viability, and proliferation of L1210 cells exposed to shock waves *in vitro* (Gambihler), 587
biological effects of shock waves: effect of shock waves on the liver and gallbladder wall of dogs—administration rate dependence (Delius), 459
capacitance hydrophones for pressure determination in lithotripsy (Filipczynski), 157
effects of lithotripter fields on development of chick embryos (Hartman), 581
estimation of the temperature increase in the focus of a lithotripter for the case of high rate administration (Filipczynski), 149 (see also 727L)
influence of the shock wave application mode on the growth of A-Mel 3 and SSK2 tumours *in vivo* (Weiss), 595
killing of *Drosophila* larvae by the fields of an electrohydraulic lithotripter (Carstensen), 687

lung damage from exposure to pulsed ultrasound (Child), 817
lung damage from exposure to the fields of an electrohydraulic lithotripter (Hartman), 675

Probe wave
ultrasonic imaging of the nonlinear parameter B/A: simulation studies to evaluate phase and frequency modulation methods (Kim), 175

Prostate
histological analysis of ultrasonic images of the prostate: an accurate technique (Hendrikx), 667
"sonoelasticity" images derived from ultrasound signals in mechanically vibrated tissues (Lerner), 231

Protein synthesis
protein synthesis stimulated in sonicated sugar beet cells and protoplasts (Joersbo), 719

Pseudocyst
operative ultrasound guidance for various surgical procedures (Machi), 37

Pulmonary artery
estimation of aortic and pulmonary blood flow in a paediatric population using Doppler ultrasound: an *in vitro* study (Soul), 659

Pulsatility index
Doppler waveform pulsatility index and resistance, pressure and flow in the umbilical placental circulation: an investigation using a mathematical model (Thompson), 449
fetal Doppler shift waveforms in intrauterine growth retardation: Laplace transform analysis technique (Stone), 773
relationship between pulsatility indices of Doppler flow signals and CO_2-reactivity within the middle cerebral artery in extracranial occlusive disease (Ley-Pozo), 763
site-dependent effects of increases in placental vascular resistance on the umbilical arterial velocity waveform in fetal sheep (Adamson), 19
transcranial pulsed Doppler measurements of blood flow velocity in the middle cerebral artery: reference values at rest and during hyperventilation in healthy children and adolescents in relation to age and sex (Brouwers), 1
uterine bloodflow velocity waveforms before and after transcervical chorionic villus sampling (Cohen-Overbeek), 129

Pulsed Doppler
a validation study on the reproducibility of transcranial Doppler velocimetry (Maeda), 9
assessment of the distensibility of superficial arteries (Hoeks), 121
automatic vessel tracking and measurement for Doppler studies (Wilson), 645
estimation of aortic and pulmonary blood flow in a paediatric population using Doppler ultrasound: an *in vitro* study (Soul), 659
fetal Doppler shift waveforms in intrauterine growth retardation: Laplace transform analysis technique (Stone), 773
transcranial pulsed Doppler measurements of blood flow velocity in the middle cerebral artery: reference values at rest and during hyperventilation in healthy children and adolescents in relation to age and sex (Brouwers), 1

uterine bloodflow velocity waveforms before and after transcervical chorionic villus sampling (Cohen-Overbeek), 129

Pump wave
ultrasonic imaging of the nonlinear parameter B/A: simulation studies to evaluate phase and frequency modulation methods (Kim), 175

PVDF hydrophones
a novel method to control P+/P− ratio of shock wave pulses used in the extracorporeal piezoelectric lithotripsy (EPL) (Lewin), 473

Q

Quinn-Reid, D., see Adler, D. D.

R

Radial artery
determination of the luminal diameter of the radial artery in man by high frequency ultrasound: a methodological study (Nielsen), 787

Radiation force
temporally-specific modification of myelinated axon excitability *in vitro* following a single ultrasound pulse (Mihran), 297

Rat
acute effects of ultrasound on skeletal muscle oxygen tension, blood flow and capillary density (Rubin), 271

Ray tracing
an evaluation of an *in vivo* local sound speed estimation by the crossed beam method (Kondo), 65

Reference values
transcranial Doppler sonography: anatomical landmarks and normal velocity values (Ringelstein), 745
transcranial pulsed Doppler measurements of blood flow velocity in the middle cerebral artery: reference values at rest and during hyperventilation in healthy children and adolescents in relation to age and sex (Brouwers), 1

Refraction
an evaluation of an *in vivo* local sound speed estimation by the crossed beam method (Kondo), 65
effect of scan format on refraction artifacts (Ziskin), 183

Regurgitation
Doppler color flow in echocardiography: analytical and *in vitro* investigations of the quantitative relationship between orifice flow and color jet dimensions (Holen), 543

Reid, J., see Nowicki, A.

Renal tissue
prenatal diagnosis by ultrasound in pregnancies at risk for autosomal recessive polycystic kidney disease (Reuss), 355

Reneman, R. S., see Hoeks, A. P. G.

Reperfusion
myocardial ultrasonic backscatter for characterization of ischemia and reperfusion: relationship to wall motion (Barzilai), 391

Reports, meetings
Arbeille, Ph.: the second international perinatal Doppler society meeting, 13–15 September, 1989, Paris, 93
Daft, C. M. W.: IEEE 1989 ultrasonics symposium, 3–6 October, 1989, Montreal, Quebec, 96
Greenleaf, J. F.: the eighteenth international symposium on acoustical imaging, 18–20 September, 1989, Santa Barbara, California, 94
Powis, R. L.: the eleventh international conference of the IEEE engineering in medicine and biology, 9–12 November, 1989, Seattle, Washington, 319
Sommer, W.: the fifth international congress on interventional ultrasound, 29 August–1 September, Copenhagen, Denmark, 195

Reproducibility
a validation study on the reproducibility of transcranial Doppler velocimetry (Maeda), 9
inter- and intra-observer variability of Doppler peak velocity measurements: an *in vitro* study (Tessler), 653

Resistance index
fetal Doppler shift waveforms in intrauterine growth retardation: Laplace transform analysis technique (Stone), 773

Retrolenticular afterglow
effect of scan format on refraction artifacts (Ziskin), 183

Reviews, book
Ultrasound in neurosurgery: Rubin and Chandler (Gooding), 525
Ultrasound of the prostate: Fornage (Cooperberg), 193
Reuss, A., Wladimiroff, J. W., Stewart, P. A. and Niermeijer, M. F.: prenatal diagnosis by ultrasound in pregnancies at risk for autosomal recessive polycystic kidney disease, 355

R. F. analysis
assessment of the distensibility of superficial arteries (Hoeks), 121
Riederer-Henderson, M. A., see Forster, F. K.
Riederer-Henderson, M. A., see Olerud, J. E.
Rijntjes, N. V. M., see Hendrikx, A. J. M.
Rijsterborgh, H., Mastik, F., Lancee, C. T., van der Steen, A. F. W., Sassen, L. M. A., Verdouw, P. D., Roelandt, J. and Bom, N.: ultrasonic myocardial integrated backscatter and myocardial wall thickness in animal experiments, 29
Ringelstein, E. B., Kahlscheuer, B., Niggemeyer, E. and Otis, S. M.: transcranial Doppler sonography: anatomical landmarks and normal velocity values, 745
Ringelstein, E. B., see Ley-Pozo, J.
Ritchie, J. W. K., see Adamson, S. L.
Rodriguez, O., see Enwemeka, C. S.
Roelandt, J., see Rijsterborgh, H.
Roemer, R. B., see Billard, B. E.

de la Rosette, J. J. M. C. H., see Hendrikx, A. J. M.
Rubin, J. M., see Adler, D. D.
Rubin, J. M., see Adler, R. S.
Rubin, M. J., Etchison, M. R., Condra, K. A., Franklin, Jr., T. D. and Snoddy, A. M.: acute effects of ultrasound on skeletal muscle oxygen tension, blood flow and capillary density, 271

S

Safety
temperature elevation generated by a focused Gaussian beam of ultrasound (Wu), 489

Sample volume
automatic vessel tracking and measurement for Doppler studies (Wilson), 645
estimation of aortic and pulmonary blood flow in a paediatric population using Doppler ultrasound: an *in vitro* study (Soul), 659
the use of a Diasonics DRF400 duplex ultrasound scanner to measure volume flow in arterio-venous fistulae in patients undergoing haemodialysis: an analysis of measurement uncertainties (Oates), 571

Sariego, J., see Machi, J.
Sassen, L. M. A., see Rijsterborgh, H.

Scan format
effect of scan format on refraction artifacts (Ziskin), 183

Scanning laser acoustic microscopy
correlation of tissue constituents with the acoustic properties of skin and wound (Olerud), 55

Scattering
correlation of tissue constituents with the acoustic properties of skin and wound (Olerud), 55
diffraction correction methods for pulse-echo acoustic attenuation estimation (Cespedes), 707
ultrasonic assessment of skin and surgical wounds utilizing backscatter acoustic techniques to estimate attenuation (Forster), 43

Schats, R., Jansen, C. A. M. and Wladimiroff, J. W.: asynchronous appearance of embryonic cardiac activity in multiple pregnancies following *in vitro* fertilization, 728L
Schenk, E., see Carstensen, E. L.
Schenk, E., see Hartman, C.
Schery, L. A., see Child, S. Z.
Schiller, V. L., see Tessler, F. N.
Schlindwein, F. S. and Evans, D. H.: selection of the order of autoregressive models for spectral analysis of Doppler ultrasound signals, 81
Schmidt, A. W., see Nowicki, A.
Schrank, E., Phillips, D. J., Moritz, W. E. and Strandness, Jr., D. E.: a triangulation method for the quantitative measurement of arterial blood velocity magnitude and direction in humans, 499
Sehgal, C. M., see Kim, D.
Semmelink, H., see Hendrikx, A. J. M.

Sephadex
a comparison of the Doppler spectra from human blood and artificial blood used in a flow phantom (Hoskins), 141

Sex related
transcranial pulsed Doppler measurements of blood flow velocity in the middle cerebral artery: reference values at rest and during hyperventilation in healthy children and adolescents in relation to age and sex (Brouwers), 1

Shock waves
a novel method to control P+/P− ratio of shock wave pulses used in the extracorporeal piezoelectric lithotripsy (EPL) (Lewin), 473
biological effects of shock waves: cavitation by shock waves in piglet liver (Delius), 467
biological effects of shock waves: cell disruption, viability, and proliferation of L1210 cells exposed to shock waves *in vitro* (Gambihler), 587
biological effects of shock waves: effect of shock waves on the liver and gallbladder wall of dogs—administration rate dependence (Delius), 459
capacitance hydrophones for pressure determination in lithotripsy (Filipczynski), 157
effects of lithotripter fields on development of chick embryos (Hartman), 581
estimation of the temperature increase in the focus of a lithotripter for the case of high rate administration (Filipczynski), 149 (see also 727L)
influence of the shock wave application mode on the growth of A-Mel 3 and SSK2 tumours *in vivo* (Weiss), 595
killing of *Drosophila* larvae by the fields of an electrohydraulic lithotripter (Carstensen), 687
lung damage from exposure to pulsed ultrasound (Child), 817
lung damage from exposure to the fields of an electrohydraulic lithotripter (Hartman), 675

Shunts
Doppler color flow in echocardiography: analytical and *in vitro* investigations of the quantitative relationship between orifice flow and color jet dimensions (Holen), 543

Siddiqi, T. A., Plessinger, M. A., Meyer, R. A. and Woods, Jr., J. R.: bioeffects of diagnostic ultrasound on auditory function in the neonatal lamb, 621L
Sigel, B., see Machi, J.

Signal processing
automatic vessel tracking and measurement for Doppler studies (Wilson), 645

Skidmore, R., see Stone, P. R.

Skin
correlation of tissue constituents with the acoustic properties of skin and wound (Olerud), 55
ultrasonic assessment of skin and surgical wounds utilizing backscatter acoustic techniques to estimate attenuation (Forster), 43

Smeets, F. A. M., see Hoeks, A. P. G.
Snoddy, A. M., see Rubin, M. J.
Sobel, B. E., see Barzilai, B.

Sonoelasticity
"sonoelasticity" images derived from ultrasound signals in mechanically vibrated tissues (Lerner), 231
tissue response to mechanical vibrations for "sonoelasticity imaging" (Parker), 241

Soul, F. J., Hames, T. K., Thomas, V. L. and Bacon, R. J.: estimation of aortic and pulmonary blood flow in a paediatric population using Doppler ultrasound: an *in vitro* study, 659

Speckle
a comparison of the Doppler spectra from human blood and artificial blood used in a flow phantom (Hoskins), 141
a comparison of three different filters for speckle reduction of Doppler spectra (Hoskins), 375
autocorrelation length of normal and myopathic human myocardium measured by acoustic microscopy: implications for clinical ultrasonic tissue characterization (Linker), 793

Spectral analysis
a simulation of transit time effects in Doppler ultrasound signals (Jones), 607
computer evaluation of Doppler spectral envelope area in patients having a valvular aortic stenosis (Cloutier), 247
effects of transducer beam geometry and flow velocity profile on the Doppler power spectrum: a theoretical study (Bascom), 279
estimation of the temperature increase in the focus of a lithotripter for the case of high rate administration (Filipczynski), 149 (see also 727L)
on the behaviour of instantaneous frequency estimators implemented on Doppler flow imagers (Nowicki), 511
selection of the order of autoregressive models for spectral analysis of Doppler ultrasound signals (Schlindwein), 81
"sonoelasticity" images derived from ultrasound signals in mechanically vibrated tissues (Lerner), 231
ultrasonic assessment of skin and surgical wounds utilizing backscatter acoustic techniques to estimate attenuation (Forster), 43

Spectral broadening
a simulation of transit time effects in Doppler ultrasound signals (Jones), 607

Spectral difference method
diffraction correction methods for pulse-echo acoustic attenuation estimation (Cespedes), 707

Spectral envelope area
computer evaluation of Doppler spectral envelope area in patients having a valvular aortic stenosis (Cloutier), 247

Speed of sound
an evaluation of an *in vivo* local sound speed estimation by the crossed beam method (Kondo), 65
correlation of tissue constituents with the acoustic properties of skin and wound (Olerud), 55
effect of scan format on refraction artifacts (Ziskin), 183

van der Steen, A. F. W., see Rijsterborgh, H.
Steiger, D. L., see Olerud, J. E.

Stenosis
Doppler color flow in echocardiography: analytical and *in vitro* investigations of the quantitative relationship between orifice flow and color jet dimensions (Holen), 543
morphological characterization of carotid artery stenoses by ultrasound duplex scanning (Widder), 349

Stewart, G. J., Lachman, J. W., Alburger, P. D., Ziskin, M. C., Philips, C. M. and Jensen, K.: intraoperative venous dilation and subsequent development of deep vein thrombosis in patients undergoing total hip or knee replacement, 133
Stewart, P. A., see Reuss, A.
Stirrat, G. M., see Stone, P. R.
Stone, P. R., Skidmore, R., Baker, J. D. and Stirrat, G. M.: fetal Doppler shift waveforms in intrauterine growth retardation: Laplace transform analysis technique, 773
Strandness, D. E., see van Bemmelen, P. S.
Strandness, Jr., D. E., see Schrank, E.

Sugar beet
protein synthesis stimulated in sonicated sugar beet cells and protoplasts (Joersbo), 719

Surgery
operative ultrasound guidance for various surgical procedures (Machi), 37

Sutherland, M. L., see Tessler, F. N.

Systolic/diastolic power ratio
effects of transducer beam geometry and flow velocity profile on the Doppler power spectrum: a theoretical study (Bascom), 279

Systolic velocity integral
computer evaluation of Doppler spectral envelope area in patients having a valvular aortic stenosis (Cloutier), 247

T

Tagaya, M., see Maeda, H.
Takamizawa, K., see Kondo, M.
Takehara, Y., see Kondo, M.

Temperature elevation
effects of physical parameters on high temperature ultrasound hyperthermia (Billard), 409
estimation of the temperature increase in the focus of a lithotripter for the case of high rate administration (Filipczynski), 149 (see also 727L)
temperature elevation generated by a focused Gaussian beam of ultrasound (Wu), 489

Tendons
the biochemical effects of low intensity ultrasound on healing tendons (Enwemeka), 801

Tensile strength
the biochemical effects of low intensity ultrasound on healing tendons (Enwemeka), 801

Tessler, F. N., Kimme-Smith, C., Sutherland, M. L., Schiller, V. L., Perrella, R. R. and Grant, E. G.: inter- and intra-observer variability of Doppler peak velocity measurements: an *in vitro* study, 653
Tfelt-Hansen, P., see Nielsen, T. H.

Therapeutic ultrasound
acute effects of ultrasound on skeletal muscle oxygen tension, blood flow and capillary density (Rubin), 271
effects of physical parameters on high temperature ultrasound hyperthermia (Billard), 409
macrophage responsiveness to therapeutic ultrasound (Young), 809
temperature elevation generated by a focused Gaussian beam of ultrasound (Wu), 489
the biochemical effects of low intensity ultrasound on healing tendons (Enwemeka), 801
the effect of therapeutic ultrasound on angiogenesis (Young), 261

Thermal effects
effects of physical parameters on high temperature ultrasound hyperthermia (Billard), 409
temperature elevation generated by a focused Gaussian beam of ultrasound (Wu), 489

Thomas, V. L., see Soul, F. J.
Thompson, R. S. and Trudinger, B. J.: Doppler waveform pulsatility index and resistance, pressure and flow in the umbilical placental circulation: an investigation using a mathematical model, 449

Thrombosis
intraoperative venous dilation and subsequent development of deep vein thrombosis in patients undergoing total hip or knee replacement (Stewart), 133
visualization of calf veins by color flow imaging (van Bemmelen), 15

Time lapse
time lapse and microscopic examinations of insonated *in vitro* cells (Miller), 73

Tissue characterisation
an evaluation of an *in vivo* local sound speed estimation by the crossed beam method (Kondo), 65
autocorrelation length of normal and myopathic human myocardium measured by acoustic microscopy: implications for clinical ultrasonic tissue characterization (Linker), 793
Doppler ultrasound color flow imaging in the study of breast cancer: preliminary findings (Adler), 553
histological analysis of ultrasonic images of the prostate: an accurate technique (Hendrikx), 667
quantitative tissue motion analysis of digitized M-mode images: gestational differences of fetal lung (Adler), 561
"sonoelasticity" images derived from ultrasound signals in mechanically vibrated tissues (Lerner), 231

tissue response to mechanical vibrations for "sonoelasticity imaging" (Parker), 241
ultrasonic assessment of skin and surgical wounds utilizing backscatter acoustic techniques to estimate attenuation (Forster), 43
ultrasonic myocardial integrated backscatter and myocardial wall thickness in animal experiments (Rijsterborgh), 29
ultrasound attenuation coefficient in the fetal liver as a function of gestational age (Carson), 399

Tissue dissection
estimation of the temperature increase in the focus of a lithotripter for the case of high rate administration (Filipczynski), 149 (see also 727L)
operative ultrasound guidance for various surgical procedures (Machi), 37

Tissue effects
acute effects of ultrasound on skeletal muscle oxygen tension, blood flow and capillary density (Rubin), 271
the biochemical effects of low intensity ultrasound on healing tendons (Enwemeka), 801
the effect of therapeutic ultrasound on angiogenesis (Young), 261

Tissue movement
quantitative tissue motion analysis of digitized M-mode images: gestational differences of fetal lung (Adler), 561
"sonoelasticity" images derived from ultrasound signals in mechanically vibrated tissues (Lerner), 231
tissue response to mechanical vibrations for "sonoelasticity imaging" (Parker), 241

Tissue repair
macrophage responsiveness to therapeutic ultrasound (Young), 809
the biochemical effects of low intensity ultrasound on healing tendons (Enwemeka), 801
the effect of therapeutic ultrasound on angiogenesis (Young), 261

Toxicity
confirmation of an ultrasound-induced mutation in two *in vitro* mammalian cell lines (Doida), 699
killing of *Drosophila* larvae by the fields of an electrohydraulic lithotripter (Carstensen), 687
lung damage from exposure to pulsed ultrasound (Child), 817
lung damage from exposure to the fields of an electrohydraulic lithotripter (Hartman), 675
test for kidney hemorrhage following exposure to intense, pulsed ultrasound (Carstensen), 681
time lapse and microscopic examinations of insonated *in vitro* cells (Miller), 73

Transcranial Doppler
a validation study on the reproducibility of transcranial Doppler velocimetry (Maeda), 9
relationship between pulsatility indices of Doppler flow signals and CO_2-reactivity within the middle cerebral artery in extracranial occlusive disease (Ley-Pozo), 763

transcranial Doppler sonography: anatomical landmarks and normal velocity values (Ringelstein), 745
transcranial pulsed Doppler measurements of blood flow velocity in the middle cerebral artery: reference values at rest and during hyperventilation in healthy children and adolescents in relation to age and sex (Brouwers), 1

Transducer
clinical performance of a cone/annular array ultrasound breast scanner (Fishell), 361

Transit time
a simulation of transit time effects in Doppler ultrasound signals (Jones), 607

Transvaginal sonography
observation of Cesarean section scar by transvaginal ultrasonography (Chen), 443
the assessment of abnormal pelvic blood flow by transvaginal color and pulsed Doppler (Kurjak), 437

Triangulation method
a triangulation method for the quantitative measurement of arterial blood velocity magnitude and direction in humans (Schrank), 499

Tumors
Doppler ultrasound color flow imaging in the study of breast cancer: preliminary findings (Adler), 553
histological analysis of ultrasonic images of the prostate: an accurate technique (Hendrikx), 667
influence of the shock wave application mode on the growth of A-Mel 3 and SSK2 tumours *in vivo* (Weiss), 595
"sonoelasticity" images derived from ultrasound signals in mechanically vibrated tissues (Lerner), 231
the assessment of abnormal pelvic blood flow by transvaginal color and pulsed Doppler (Kurjak), 437
tissue response to mechanical vibrations for "sonoelasticity imaging" (Parker), 241

Trudinger, B. J., see Thompson, R. S.

Trypan blue assay
biological effects of shock waves: cell disruption, viability, and proliferation of L1210 cells exposed to shock waves *in vitro* (Gambihler), 587

U

Ulcerations
morphological characterization of carotid artery stenoses by ultrasound duplex scanning (Widder), 349

Umbilical artery
Doppler waveform pulsatility index and resistance, pressure and flow in the umbilical placental circulation: an investigation using a mathematical model (Thompson), 449
site-dependent effects of increases in placental vascular resistance on the umbilical arterial velocity waveform in fetal sheep (Adamson), 19

Umbilical placental circulation
Doppler waveform pulsatility index and resistance, pressure and flow in the umbilical placental circulation: an investigation using a mathematical model (Thompson), 449
site-dependent effects of increases in placental vascular resistance on the umbilical arterial velocity waveform in fetal sheep (Adamson), 19

Uterine artery
the assessment of abnormal pelvic blood flow by transvaginal color and pulsed Doppler (Kurjak), 437
uterine bloodflow velocity waveforms before and after transcervical chorionic villus sampling (Cohen-Overbeek), 129

V

Valvular stenosis
computer evaluation of Doppler spectral envelope area in patients having a valvular aortic stenosis (Cloutier), 247

Vascular resistance
site-dependent effects of increases in placental vascular resistance on the umbilical arterial velocity waveform in fetal sheep (Adamson), 19
uterine bloodflow velocity waveforms before and after transcervical chorionic villus sampling (Cohen-Overbeek), 129

Vasoconstriction
acute effects of ultrasound on skeletal muscle oxygen tension, blood flow and capillary density (Rubin), 271

Vasomotor reserve
relationship between pulsatility indices of Doppler flow signals and CO_2-reactivity within the middle cerebral artery in extracranial occlusive disease (Ley-Pozo), 763

Vein
intraoperative venous dilation and subsequent development of deep vein thrombosis in patients undergoing total hip or knee replacement (Stewart), 133
visualization of calf veins by color flow imaging (van Bemmelen), 15

Velocity
a triangulation method for the quantitative measurement of arterial blood velocity magnitude and direction in humans (Schrank), 499
estimation of aortic and pulmonary blood flow in a paediatric population using Doppler ultrasound: an *in vitro* study (Soul), 659
inter- and intra-observer variability of Doppler peak velocity measurements: an *in vitro* study (Tessler), 653
the use of a Diasonics DRF400 duplex ultrasound scanner to measure volume flow in arterio-venous fistulae in patients undergoing haemodialysis: an analysis of measurement uncertainties (Oates), 571
transcranial Doppler sonography: anatomical landmarks and normal velocity values (Ringelstein), 745
transcranial pulsed Doppler measurements of blood flow velocity in the middle cerebral artery: reference values at rest and during hyperventilation in healthy children and adolescents in relation to age and sex (Brouwers), 1

Velocity profile
a triangulation method for the quantitative measurement of arterial blood velocity magnitude and direction in humans (Schrank), 499
Doppler color flow in echocardiography: analytical and *in vitro* investigations of the quantitative relationship between orifice flow and color jet dimensions (Holen), 543
effects of transducer beam geometry and flow velocity profile on the Doppler power spectrum: a theoretical study (Bascom), 279
estimation of aortic and pulmonary blood flow in a paediatric population using Doppler ultrasound: an *in vitro* study (Soul), 659
the use of a Diasonics DRF400 duplex ultrasound scanner to measure volume flow in arterio-venous fistulae in patients undergoing haemodialysis: an analysis of measurement uncertainties (Oates), 571

Venous visualization
intraoperative venous dilation and subsequent development of deep vein thrombosis in patients undergoing total hip or knee replacement (Stewart), 133
visualization of calf veins by color flow imaging (van Bemmelen), 15

Verdouw, P. D., see Rijsterborgh, H.
Vered, Z., see Barzilai, B.
Vollmar, J., see Widder, B.

Volume flow
automatic vessel tracking and measurement for Doppler studies (Wilson), 645
estimation of aortic and pulmonary blood flow in a paediatric population using Doppler ultrasound: an *in vitro* study (Soul), 659
site-dependent effects of increases in placental vascular resistance on the umbilical arterial velocity waveform in fetal sheep (Adamson), 19
the use of a Diasonics DRF400 duplex ultrasound scanner to measure volume flow in arterio-venous fistulae in patients undergoing haemodialysis: an analysis of measurement uncertainties (Oates), 571

Vriens, E.M., see Brouwers, P. J. A. M.

W

Waag, R., see Holen, J.
Wachtel, H., see Mihran, R. T.

Wall motion
automatic vessel tracking and measurement for Doppler studies (Wilson), 645
effects of transducer beam geometry and flow velocity profile on the Doppler power spectrum: a theoretical study (Bascom), 279

Wall thickness
ultrasonic myocardial integrated backscatter and myocardial wall thickness in animal experiments (Rijsterborgh), 29

Waveforms
a novel method to control P+/P− ratio of shock wave pulses used in the extracorporeal piezoelectric lithotripsy (EPL) (Lewin), 473
effects of lithotripter fields on development of chick embryos (Hartman), 581
estimation of the temperature increase in the focus of a lithotripter for the case of high rate administration (Filipczynski), 149 (see also 727L)

lung damage from exposure to pulsed ultrasound (Child), 817
lysis of cells in *Elodea* leaves by pulsed and continuous wave ultrasound (Carstensen), 167
protein synthesis stimulated in sonicated sugar beet cells and protoplasts (Joersbo), 719
ultrasonic assessment of skin and surgical wounds utilizing backscatter acoustic techniques to estimate attenuation (Forster), 43

Wear, K. A., see Barzilai, B.
Weiss, N., Delius, M., Gambihler, S., Dirschedle, P., Goetz, A. and Brendel, W.: influence of the shock wave application mode on the growth of A-Mel 3 and SSK2 tumours *in vivo*, 595
Wells, P. N. T. and Halliwell, M.: a second order approximation in the Doppler equation, 423L

WFUMB
the conception, birth and childhood of WFUMB and its specialist and continental federations: the first quarter century (White), 333

White, D. N.: the conception, birth and childhood of WFUMB and its specialist and continental federations: the first quarter century, 333
Widder, B., Paulat, K., Hackspacher, J., Hamann, H., Hutschenreiter, S., Kreutzer, C., Ott, F. and Vollmar, J.: morphological characterization of carotid artery stenoses by ultrasound duplex scanning, 349
Wieneke, G. H., see Brouwers, P. J. A. M.
Williams, A. R., and Ziskin, M. C.: a demonstration of ultrasound-induced quartz wind streaming, standing waves and absorption within a standing wave field, 828L
Williams, E. D., see Oates, C. P.
Willmes, K., see Ley-Pozo, J.
Wilson, L. S., Dadd, M. J. and Gill, R. W.: automatic vessel tracking and measurement for Doppler studies, 645
Wladimiroff, J. W., see Cohen-Overbeek, T. E.
Wladimiroff, J. W., see Reuss, A.

Wound healing
macrophage responsiveness to therapeutic ultrasound (Young), 80
the biochemical effects of low intensity ultrasound on healing tendons (Enwemeka), 801
the effect of therapeutic ultrasound on angiogenesis (Young), 261
ultrasonic assessment of skin and surgical wounds utilizing backscatter acoustic techniques to estimate attenuation (Forster), 43

Wu, J. and Du, G.: temperature elevation generated by a focused Gaussian beam of ultrasound, 489

X

X-rays
confirmation of an ultrasound-induced mutation in two *in vitro* mammalian cell lines (Doida), 699

Y

Young, S. R. and Dyson, M.: macrophage responsiveness to therapeutic ultrasound, 809
Young, S. R. and Dyson, M.: the effect of therapeutic ultrasound on angiogenesis, 261

Young's modulus
tissue response to mechanical vibrations for "sonoelasticity imaging" (Parker), 241

Yutani, C., see Chiba, Y.

Z

Zalud, I., see Kurjak, A.
Zaren, H. A., see Machi, J.
Ziskin, M. C., LaFollette, Jr., P. S., Blathras, K. and Abraham, V.: effect of scan format on refraction artifacts, 183
Ziskin, M. C., see Stewart, G. J.